

Skyways

FOR BUSINESS

WEATHER FOR BUSINESS PILOTS

● AERO COMMANDER
"BREAKS ALTITUDE BARRIER"

● A TOOL KIT FOR THE CHIEF

● NEW CAB RULES—PANIC OR PANACEA?

OFFICIAL PUBLICATION
NATIONAL BUSINESS
AIRCRAFT ASSOCIATION

FEBRUARY 1958



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Quality

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for the Apache's
Overwhelming Popularity



While the price of the Piper Apache is nearly \$15,000 less than that of any other twin-engine executive plane on the market, there is no compromise with quality in this most popular of all executive twins.

Careful inspection will prove this point... will prove the Apache is second to none in quality. Workmanship is superb; engines and propellers are the finest available; electric and hydraulic systems have been thoroughly proved and improved. Over 40 transatlantic flights attest to the Apache's stamina.

Quality shows particularly in the cabin appointments, from the genuine leather upholstery to the impeccable styling. Roominess, reclining seats, head rests add to the quiet luxury of Apache travel.

Piper's ability to produce a quality airplane like the Apache at a price far below any other twin available is simply explained. For the aircraft industry, Piper is a volume producer. Piper builds nearly as many Apaches as all other executive twins combined. High volume cuts engineering and tooling costs, permits better job training and specialization. The Apache's basic design lends itself to low production man-hours.

If you're in the market for a twin, evaluate the Apache—not just for its low operating costs, but for its quality as well. It adds up to a really fine airplane at a sensible price—\$34,990 for standard Apache with 150 hp Lycomings. Available also with 160 hp engines. Send for brochure, Dept. 2-K.

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Skyways FOR BUSINESS

The official publication of the National Business Aircraft Association

COVER: Featuring weather with this issue, the cover is a montage of microphone and weather chart, key items in the Round Table discussion.

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MEET THE WBAALT*! NEW CESSNA 310B



NEW TWIN: MOST POWERFUL PER POUND

A new high-performance twin is cruising in the sky at 213 m.p.h.! It's the great new Cessna 310B—packing more power per pound of weight than any other business twin. It can climb 415 feet per minute on *one* engine while fully loaded with 5 passengers. Service ceiling: 20,700 ft. Single-engine service ceiling: 7,750 ft.

More advanced design is a major reason for the 310B's higher performance. Tip-tanks channel air flow, increase control as well as speed. Flat engine nacelles are a mere 21 inches high, reduce air resistance, actually add lift. Retractable landing gear, split-type flaps, broad-span tail group, and two 240-h.p. Continental engines increase speed, stability, safety. Advanced design shows up again in Cessna's new, quieter, larger interior—the revolutionary "Comfort-Sealed" cabin.

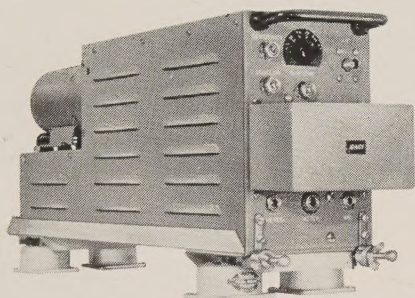
Price of the new Cessna 310B: \$59,950 f.a.f. Wichita. Call your Cessna dealer (Yellow Pages of phone book) or write CESSNA AIRCRAFT COMPANY, Dept. S-22, Wichita, Kan. Inquire about Cessna Lease Plan.



**World's Best All-Around Light Twin—Winner of the recent U.S.A.F. Light-Twin Competition.*

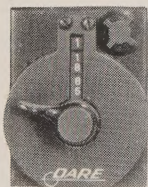
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**15-WATT MINIMUM
TRANSMITTER OUTPUT**
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MEETS CAA TSO C37 AND C38 REQUIREMENTS

The new DTR-360A is a quality transceiver throughout, meeting or surpassing every rigid design, manufacturing and inspection specification for CAA TSO approval. That means it's authorized for scheduled airline operation. You are sure of reliable performance in any aircraft.

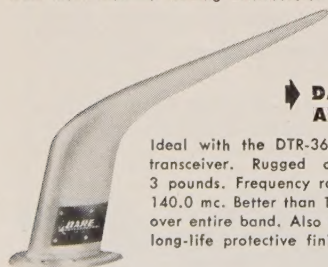


SCS-DCS, OR CROSS CHANNEL OPERATION

One Dare Control Head provides Single Channel Simplex or Double Channel Simplex operation. Two Dare Control Heads provide cross channel operation or any mode of channel selection you desire.

LIGHT WEIGHT, LOW COST

The transceiver weighs 23.5 pounds. Shockmount and control heads add little more. This lightweight, powerful, high-quality product sells for less than comparable transceivers available today. And, it's available right now from more than 65 leading distributors.



DARE DBA-1 ANTENNA

Ideal with the DTR-360A or similar transceiver. Rugged cast-aluminum. 3 pounds. Frequency range 118.0 to 140.0 mc. Better than 1.5 to 1 VSWR over entire band. Also available with long-life protective finish.

Manufacturers of a complete line of Aircraft Communications and Navigation Equipment

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INC.
Troy, Ohio

Aviation Roundup

CHAMPION AIRCRAFT CORP., Osceola, Wis., announces addition of two new models to 1958 line . . . "DX'er," low priced business airplane featuring 140 hp Lycoming engine, long range fuel supply, sound-proofing, other extras . . . "Sky-Trac," also features 140 hp engine, increased gross weight for greater utility in patrol and agricultural fields. Prices about \$6,500.

★ ★ ★

OPTIMISTIC VIEWS FOR 1958 from aircraft industry representatives . . . William C. Wold, Wm. C. Wold Associates, specialists in sale of transport aircraft, "a definitely noticeable upturn in aircraft marketing conditions" is under way, including the executive or business aircraft market . . . "Sales of electronic equipment for aircraft and missile control should be one of the stronger segments of aviation industry throughout 1958," Stephen F. Keating, vice pres., Minneapolis-Honeywell's Military Products Group . . . "New advances in semi-conductors, electron tubes, circuitry, automatic controls will contribute greatly to continued progress of American industry during 1958," Rollin M. Russell, group executive, Hughes Products Div., Hughes Aircraft Co.

★ ★ ★

VEST AIRCRAFT CO., Denver, Colo., buys out entire stock of Temco Riley Twin Navions from Temco Aircraft Co. Includes nine new and four demonstrator planes. Estimated purchase price \$250,000. Plane has 170 hp Lycoming engines, 1,400-mile range, 180-mph cruise speed, wing tip tanks, custom interiors.

★ ★ ★

SATELLITE BUSINESS PLANE undergoing CAA certification tests. The two-place, single-engine model product of Superior Aircraft Co., Culver City, Calif. Plane is development of earlier Culver. Has 90 hp Continental; reported to climb at 700 fpm. Firm reports 45 planes in production; 15 near completion.

★ ★ ★

MORANE-SAULNIER CO.'s MS-760 first private jet available in world. Under license agreement with the French manufacturer, Beech Aircraft Corp.'s 1958 sales program for the four-place twin-jet business plane already includes two orders, one to Timken Roller Bearing Co., other to Beech for demonstration purposes. Deliveries are promised for this year.

★ ★ ★

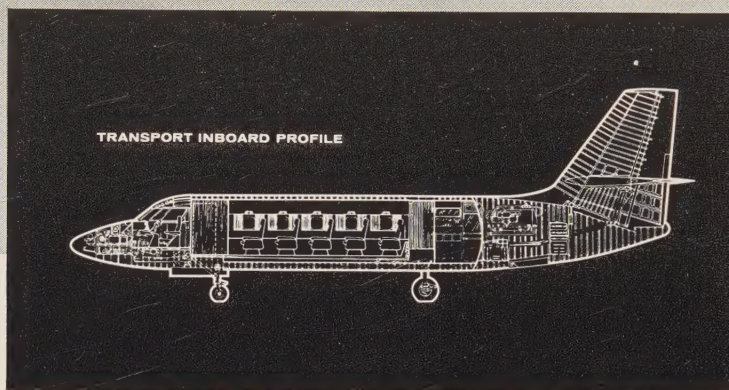
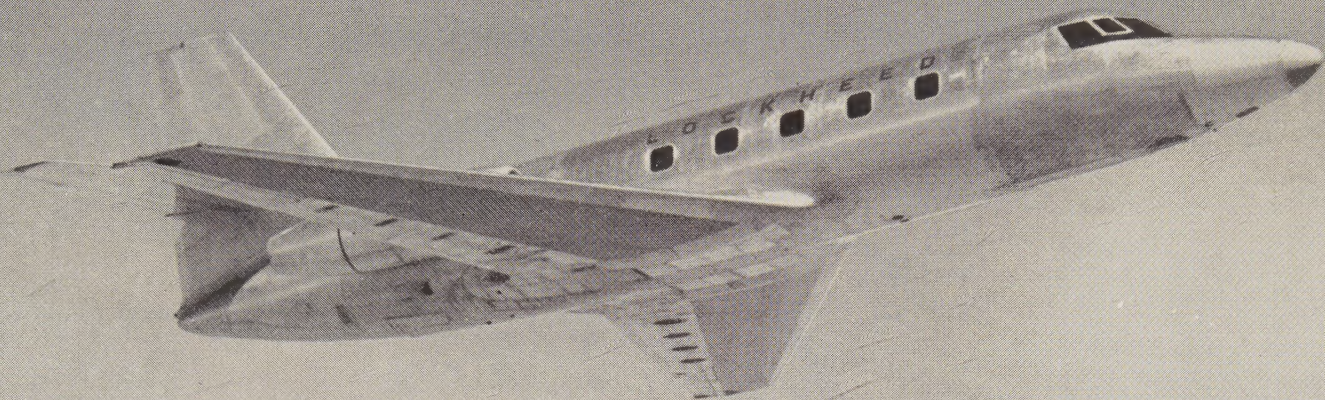
SPARTAN AIRCRAFT CO.'s AVIATION DIV., Tulsa, Okla., named distributor and service center for Collins Radio Co. for area covering Oklahoma, New Mexico, Arkansas, Georgia, Alabama, Mississippi, Texas Panhandle. Collins, one of world's largest manufacturers of communications-navigation equipment for business and commercial aircraft, will soon market new line of lightweight equipment for light aircraft. Spartan to establish dealer for Collins business aircraft equipment in firm's market area. (See photograph, page 52)

★ ★ ★

RYAN AERONAUTICAL CO.'s progress in 1957 included starting work on automatic navigator for Army liaison planes and a helicopter ground velocity indicator for Navy helicopters. These devices to be applicable to equivalent business executive type aircraft.

★ ★ ★

ROSS AVIATION, INC., Tulsa, Okla., is new fixed-base operator at North Philadelphia Airport, Pa. Fredric R. Mann, city representative and director of commerce, made the announcement adding that 1957 traffic at the airport broke previous record, increasing 69 percent over 1956. City building large hangar with mid-year completion date; will house Ross-operated maintenance shop. J. R. Ross is president of 14-year-old firm; Al Guthrie and Joe Cannon, vice presidents. Ross operates 23 planes flying some 21,000,000 miles annually. Firm to pay rent and percentage of gross sales to city. (Continued on page 9)



Now flying—the new multi-mission Lockheed **JETSTAR**

—the answer to the urgent need for a jet utility trainer-transport.

Designed for a variety of Jet Age military missions, the Lockheed JETSTAR is a utility jet transport that flies 500-550 mph, at altitudes up to 45,000 feet for distances of 1,800 statute miles or more.

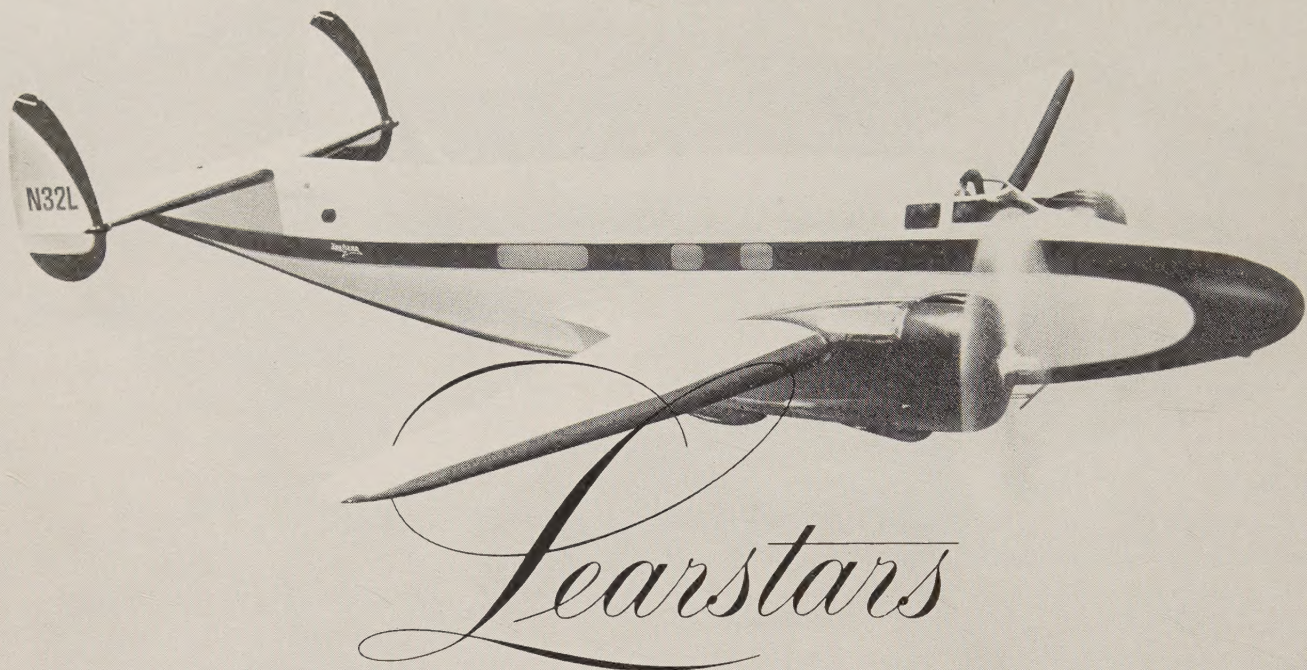
Amazingly quiet (due to aft fuselage mounting of engine jet pods) the new JETSTAR will be powered with two Wright TJ37 engines—or with four General Electric J85's or Fairchild J83's.

The JETSTAR carries a full complement of radio and navigation gear and is fully pressurized and air conditioned.

Like all Lockheed planes, the new JETSTAR is easy to maintain and economical to operate. And it has the inherent stamina to insure optimum utilization and long life—qualities that are more important in military aircraft today than ever before.

LOCKHEED *means leadership*

GEORGIA DIVISION, Lockheed Aircraft Corporation, Marietta, Georgia

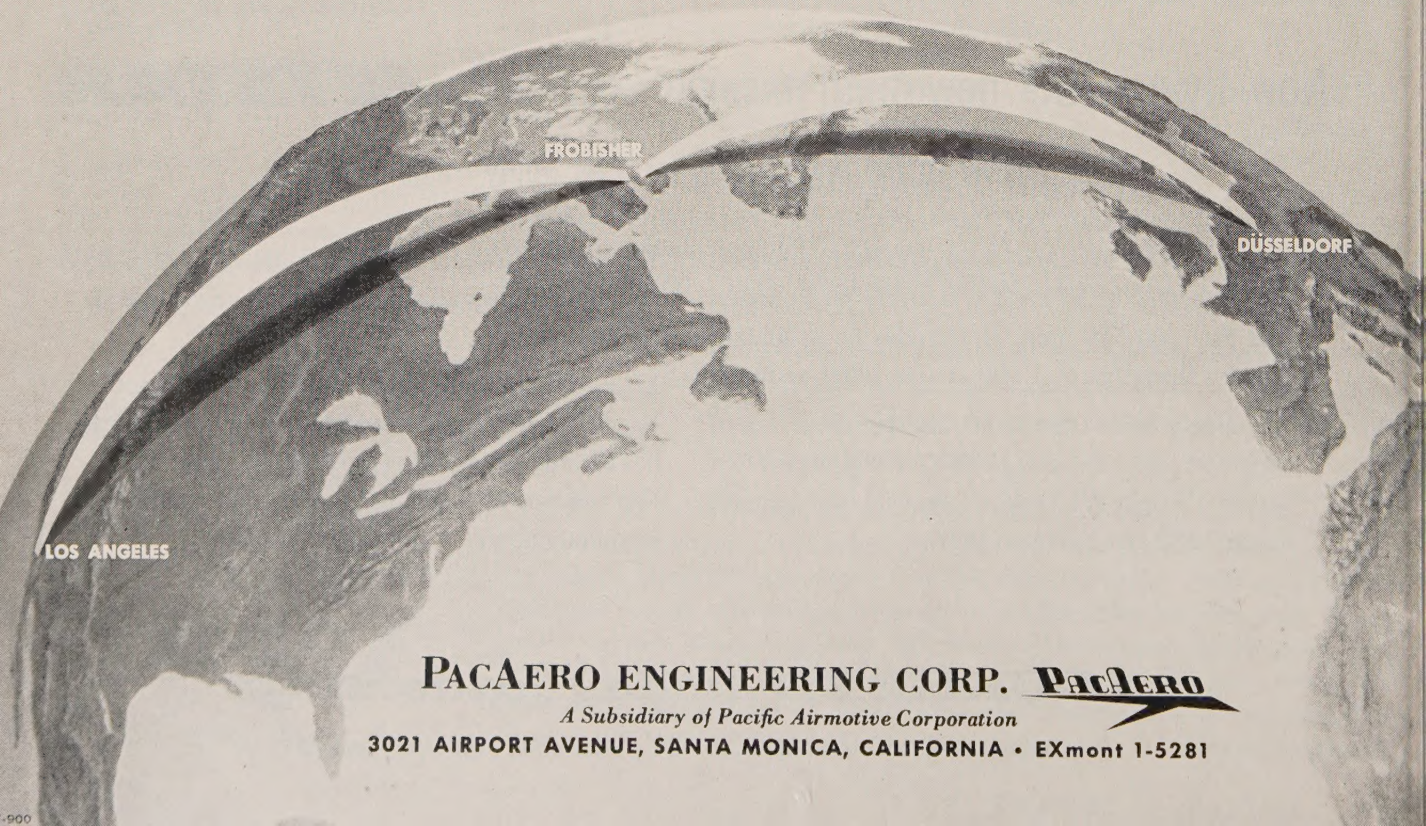


fly the polar route...
No other business aircraft can!

On November 10, 1957, a standard twin-engine production model LEARSTAR was flown from PacAero's assembly line in Santa Monica, California, over the Frobisher polar route for delivery in Dusseldorf, Germany. One stop for refueling was made. No special

equipment, no auxiliary fuel tanks were carried. This 22 hour, 58 minute polar flight is typical of LEARSTAR safety, performance and ability—approached by no other business aircraft and matched by only three commercial airliners.

LEARSTAR is the only business aircraft in its class licensed in AIRLINE TRANSPORT CATEGORY CAR 4b.



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NBAA . . . Director's Notes

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Just as though the Department of Defense hasn't enough worries with their rockets and missiles program—a new hazard has presented itself to them and to all of us in the flying business.

Amateur rocketeers are springing up like wild-fire around the country.

These rocketeers, ranging from grade school to university level, are running count-downs . . . blasting off . . . and whizzing their home-made missiles through space like crazy.

And, these ballistic boys (and girls) are not too careful about the possibility of one of their magnificent missiles *clobbering an aircraft*.

Bergstrom Air Force Base, as an example, recently had a scientific club's rocket rip through the air base traffic pattern. Created no end of concern.

With all the facilities the Department of Defense has at its command—air bases, restricted areas, missile ranges, testing and proving grounds, located in every part of the United States—why doesn't the top Pentagon brass make these areas available to the rocket enthusiasts?

The advantages are obvious:

The amateur rocket and missile groups would be officially encouraged to continue their experiments and scientific research.

A greater degree of safety would be offered to the launching parties, to the general public and to all aviation.

And—always a possibility—the Department of Defense would be on top of any significant break-through developed by this vast reservoir of eager scientists.

February 28th is the deadline for comments on CAB's proposed legislation which would affect:

1. Acrobatic flight visibility minimums.
2. Basic VFR minimum weather conditions
 - a. In control zones
 - b. Outside controlled airspace
 - c. In High Density Zones
3. VFR cruising altitudes
4. IFR cruising altitudes
5. Instrument approach procedures
6. The raising of control area "floor" levels above 700 feet.

NBAA members received detailed report of the CAB's proposals early in January. NBAA members and all other business aircraft users are urged to review carefully the proposals and to send comments for or against the rule-making to NBAA headquarters.

* * *

Time-consuming delays in issuing Supplemental Type Certificates by CAA can and must be eliminated, says L. V. Emery, president of Executive Aircraft Service, NBAA member of Dallas, and he has presented CAA with a four-step program to do just that.

The program—developed by a group of repair station representatives—would: 1) Turn the responsibility of

approval of aircraft modification engineering to the CAA approved repair stations which maintain qualified engineering personnel; 2) Modernize Manual 18 to meet current requirements; 3) Increase training for CAA agents in order that they may be better qualified to evaluate the modifications and their methods; 4) Permit designated engineering representatives to approve STC's subject to later review by CAA.

* * *

What will this Congress do to the CAA's budget?

According to the Federal Airways Plan, \$232,408,000 should be allocated for operations and maintenance. \$202,458,000 is slated for long range terminal aid radars, VOR's, ILS's, enlarging ARTC centers, control towers, radio stations (INSACS) and other aids to navigation and communication.

Current emphasis on the missiles program, many aviation observers believe, could cause drastic cuts in the CAA's budget.

WHERE these cuts will be made and *HOW* much these cuts will affect the CAA program is of vital concern to everyone in the aviation industry.

* * *

Latest attempt by WHAS-TV, Louisville, Ky., to stick a 1,859-foot (above the ground) tower into the air in the vicinity of Louisville's two airports was recently disapproved by the regional airspace subcommittee hearing the case in New York.

More attempts will follow we are assured.

NBAA members joined with other civil and military aviation to point out the hazards invited by this proposed tall tower.

* * *

NBAA's MAINTENANCE DIGEST, issued each month to members, is paying huge dividends—according to letters and comments received.

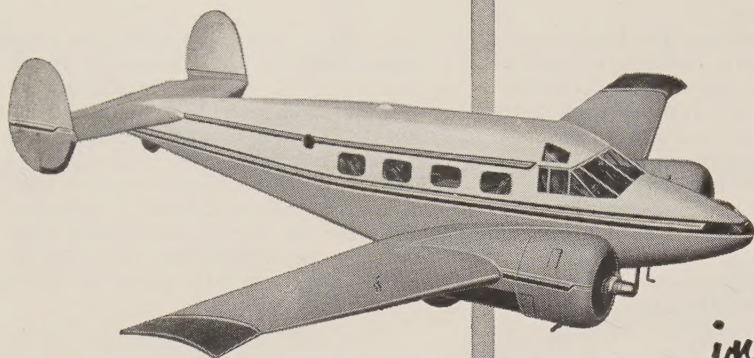
Compiled from daily mechanical reports and malfunction reports received by the CAA and CAB, the monthly digest has proved to be a valuable maintenance check-list for all types of aircraft operated in the business fleet.

* * *

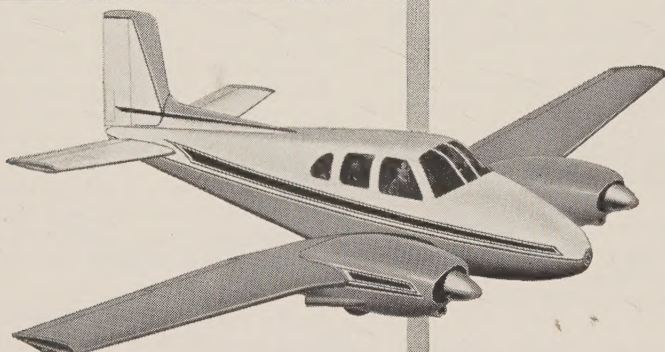
The latest revised listing of CAA Flight Operations and Airworthiness Field Offices is available at NBAA headquarters.

The offices are responsible for the initial handling of all matters dealing with: aeronautical competency of airmen, air agencies, and air carriers; manufacture, repair, alteration and maintenance of aircraft and components; compliance with rules and standards governing flight operations; investigation of accidents and violations; promotion of safe flying; and maintenance of close liaison with state and local enforcement agencies.

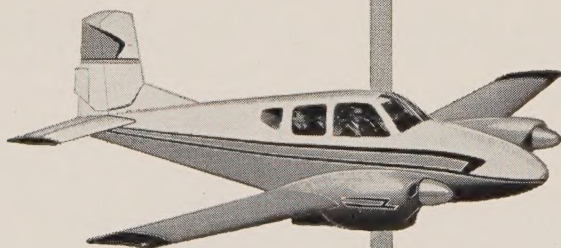
Bill Lawton.



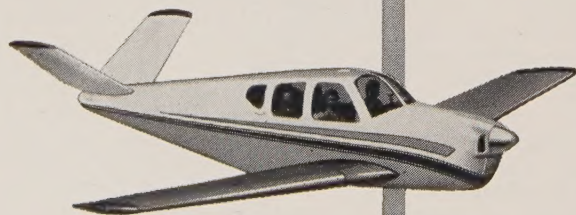
The eight-place *Beechcraft Super 18*
 RANGE . . . up to 1,626 miles nonstop
 SPEED . . . up to 234 miles per hour



The six-place *Beechcraft Twin-Bonanza*
 RANGE . . . up to 1,650 miles nonstop
 SPEED . . . up to 240 miles per hour



The four-place *Beechcraft Travel Air*
 RANGE . . . up to 1,410 miles nonstop
 SPEED . . . up to 209 miles per hour



The four-place *Beechcraft Bonanza*
 RANGE . . . up to 1,060 miles nonstop
 SPEED . . . up to 210 miles per hour

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Your Beechcraft distributor or dealer will be happy to demonstrate any of these airplanes and to explain the finest leasing and financing plans in aviation. Or write to Beech Aircraft Corporation, Wichita, Kansas, U. S. A.

Beechcraft



BEECHCRAFTS ARE THE AIR FLEET OF AMERICAN BUSINESS

Aviation Roundup

BRISTOL-ACES, INC., new name of Bristol Aero Engines, Ltd. and Air Carrier Engine Service, Inc., will set up first commercial turbine engine overhaul company in U.S. Based at Miami, Fla., firm will overhaul Bristol-built turbine engines as well as other turbo-prop, turbo-jet engines. Base expected to be ready by September. Projected annual revenue and spending in 1959 is about \$5,000,000. Air Carrier Engine Service, Inc., CAA approved repair station with unlimited powerplant rating, is in 13th year of operation.

★ ★ ★

ALLISON DIV., GENERAL MOTORS, has begun shipment of prop-jet engines to Lockheed Aircraft Corp. for Electra installation. Allison also providing turbo-prop engines for On Mark's executive A-26 conversion, Marksman 450.

★ ★ ★

AIRESEARCH DIV., GARRETT CORP., to equip North American Sabreliner and Grumman Gulfstream, new executive business aircraft and military transports, for high altitude flight comfort. Pressurization, air cycle cooling and electronic temperature control systems to give low level environment at high level flight. Twin-jet Sabreliner has two-man crew, four to eight passengers; Gulfstream, twin turbo-prop model, carries ten to 12 passengers.

★ ★ ★

SECOND MAJOR WASHINGTON, D.C., area airport to be established at Quantico, Va., near site of present Herndon Fan Marker. Decision made by Howard Quesada after survey controversy of eight, nine years. Quesada, special assistant for aviation to President Eisenhower, recommends also closing Bolling AFB and Anacostia NAS, both to move to Andrews AFB. New airport, to be built by CAA, will provide first jet-age field for Washington area.

★ ★ ★

FRENCH FIRMS TO BUILD BUSINESS PLANES, four-place Mercurey and twin-engine executive Anjou, by Boisavia Co. and Brissoneau-Lotz. Mercurey to be built at B-L factories at Creil with first to leave assembly line this month at rate of one per week. Boisavia's future, devoted to perfecting prototypes.

★ ★ ★

WHO'S NEW: Thomas S. Banes, appointed director, Air Navigation Bureau, and assistant secretary general, International Civil Aviation Organization . . . elected, George M. Bunker, 1958 chairman, Aircraft Industries Assn.: Board of Governors . . . elected, Winston Castleberry, president, Aircraft Service Assn. . . re-elected, Edward Keightley, 1958 chairman, Aviation Advisory Committee of American Petroleum Industries Committee.

E. A. Bellande, elected vice chairman of board, Garrett Corp., Los Angeles, Calif. . . . Percy L. Spencer elected senior vice president, Raytheon Mfg. Co., Waltham, Mass.

Joseph C. Watson appointed Associate director (international), CAB's Bureau of Air Operations . . . Al Huber named manager, Bakersfield-Kern County Airport, Calif. . . . James E. Young, named manager, Bendix Aviation Corp.'s sales office, Dayton, O. . . . Richard G. Jones named Western District Mgr., Industrial Electronics Div., Motorola, Inc., Burlingame, Calif.

Hugh I. Gillham appointed chief engineer, Trecker Aircraft Corp., Milwaukee, Wis. . . . Fred Thearle named chief engineer, Transland Co., Torrance, Calif. . . . Charles W. Carmody appointed assistant director, Office of Air Traffic Control, CAA, Dept. of Commerce, Washington, D.C. . . . Robert S. Kinsey appointed director of engineering, Utica Div., Bendix Aviation Corp. . . . Al Brand, named manager, Chicago training facility, Flight Safety, Inc.

★ ★ ★

DATELINES . . . Feb. 17, 1958 Conference, Professional Divisions, American Society of Mechanical Engineers, Hotel Huntington-Sheraton, Pasadena, Calif. . . . March 3-6. International Gas Turbine Power Division Conference and Exhibit, A.S.M.E., Shoreham Hotel, Washington, D.C.

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FEBRUARY 1958

Wings Club, New York

Weather Planning for the Business Pilot



PARTICIPANTS in the discussion were, from left, standing, A. C. Peterson, U.S. Weather Bureau; John Murray, Murray & Trettle; John Wallace, Northeast Weather Service; Jim Hopkins, American Can Co.; Don Teel, U.S. Steel Corp.; Norman Campbell, National Lead Co. Seated from left are Kenneth Horton, Sinclair

Refining Co.; Kenneth Spengler, moderator, American Meteorological Society; A. F. Merewether, co-moderator, American Airlines; Capt. H. R. Van Liew (and N. I. Lacey, not shown), National Weather Forecasting; and Joe Denardo of Denardo and Farland Weather Services, not shown because of a delayed arrival.

- Terminal and route forecasts for the entire country are provided by 26 Weather Bureau forecast stations offering, also, briefing service, in person or by phone.
- "If weather were an exact science, we would have very little to offer other than that which the Weather Bureau now offers . . . with the exception of service."
- Some 225 hourly reports are available at airports with drop on CAA Weather Teletype circuits.
- Private service is considered a member of the team of the client subscribing weather service.
- A meteorologist can make one forecast of which he is confident and another that is doubtful.
- Private meteorologists advise as much as possible where most comfortable flying can be done. "We have come to the point that we can do this."
- There is very little left in aviation that is a challenge . . . except weather.
- Continuity of weather forecasts for long-distance trips is offered by private weather service.
- "We don't tell a pilot to go or not to go. It's his decision based on private service information."

Moderator Spengler (A.M.S.): Co-Moderator Merewether of American Airlines and I welcome you to SKYWAYS Round Table. Let's start with what services are required for business flying where the pilot gets the information and how, then take up the place of the U.S. Weather Bureau, its problems and how far it should go or can go, and last bring in the place of the private meteorologist, the availability of private weather services, and what their services, fees, procedures or experience are. Will a pilot of a firm not taking private weather service start out?

Teel (U.S. Steel): We do not subscribe to a weather service at present. I want clearly understood I have nothing against them. We get our weather in direct contact with the Weather Bureau coupled with teletype that has all the terminals and forecasts and the tel-

ROUND TABLE MODERATORS

A. F. MEREWETHER, co-moderator, is superintendent of weather services, American Airlines, Flushing, N. Y. Received his PhB at Brown University and his MS at M.I.T. He is a former USAF colonel, member of the Dept. of Commerce Advisory Committee on Weather Services and a past president of the American Meteorological Society.



KENNETH C. SPENGLER, moderator, is executive secretary, American Meteorological Society, member, U.S. Dept. of Commerce Advisory Committee on Weather Control. He was a member of the Dept. of Commerce Advisory Committee on Weather Services, 1953-1955. He attended M.I.T. graduate school and is a colonel in USAF Reserve.

JOSEPH DENARDO, Denardo and McFarland Weather Services, Allegheny County Airport, Dravosburg, Pa. Holds BS degree from Duquesne University. Did graduate meteorology study at Univ. of Chicago. Was Weather Detach. Commander, Air Defense Command, Pittsburgh, Pa. Is professional member, American Meteorological Society.

DON TEEL, director, Air Transportation Dept., U.S. Steel Corp., White Plains, N. Y. Served with U.S. Air Corps and RAF. Former pilot and operations manager, Argentine Air Lines.

NORMAN CAMPBELL, pilot, National Lead Co., Stratford, Conn. A former military pilot with Alaskan Div., Air Transport Command, 1941-1945. Chief pilot with Zwartop Air Transport, Detroit, 1953-1956.

H. R. VAN LIEW, president, National Weather Forecasting Corp., Newark, N. J., and a United Air Lines captain. He retired as a colonel after 28 years with U.S. Marine Corps. He has been with United Air Lines for 25 years.

PARTICIPANTS

JIM HOPKINS, chief pilot, American Can Co., White Plains, N. Y. Business pilot since 1939. During WWII was civilian flight instructor; test pilot, Flight Test Section, Republic Aviation Corp.; and Air Transport Command pilot. He holds Air Transport Pilot Rating.

KENNETH HORTON, pilot supervisor, Sinclair Refining Co., White Plains, N. Y. Served in RCAF and RAF during WWII. Graduate of British International Airline School. Former BOAC captain. Was a company pilot in Ethiopia, 1949-1951.

JOHN E. WALLACE, president, Northeast Weather Service, Lexington, Mass. Received B.S. in mechanical engineering, Rice Institute; M.S. in Meteorology, Cal. Tech. Former chief, Forecast Section, Hqs. AAF, Washington; former chief, Guam Weather Central. Did weather research at M.I.T., 1946. Has held present position since 1947.

A. C. PETERSON, chief, Domestic Aviation Section, U.S. Weather Bureau, Washington, D. C. Former USAF weather officer and superintendent Meteorology, TWA International Div. Sent by U.S. Weather Bureau on special assignment to Philippines, 1947-1950, to rehabilitate Philippine Government weather forecast service.

NORMAN I. LACEY, chief forecaster, National Weather Forecasting Corp., Newark, N. J. Lt. Col. USAFR, Air Weather Service. Was commander of one of first WWII mobile weather units. M.I.T. graduate, he was TWA regional aerologist for two years at Cairo.

JOHN R. MURRAY, Murray and Trettle, consulting meteorologists, Skokie, Ill. Former USAF weather officer. Holds B.S. degree in Meteorology, Univ. of Michigan; J. D. degree, DePaul University. He is past president and charter member, National Association of Industrial Meteorologists, and is president of Chicago Chapter, American Meteorological Society.

one. A trip is assigned to a pilot. From that moment he becomes responsible for his weather on that trip and notifying his principals and for keeping them advised for any changes that might have to be made in the flight planning because of weather. This sort of makes a weather forecaster out of a pilot. We have found it to be quite adequate coverage. We are not unhappy with the Weather Bureau. True, sometimes they miss it badly, but I don't know who doesn't miss it sometimes.

Merewether (American Airlines): I'm quite clear how business pilots operate. If they're out in the field how do they arrange to get their weather service? Do they go to the Weather Bureau personally, or call by phone, or at?

Teel: Both. When they're away from the base they make it a point to go to

the Weather Bureau—at least, whenever it is touchy weather. In other words, they call the Weather Bureau first. If the weather is going to be clear, and it's cut and dried, they probably won't go to the Bureau. When it gets a little on the sticky side they'll usually go to see the map and work with the forecasters to either cancel or continue. This all starts a minimum of two hours before the flight, usually even earlier. Going back to Merewether's example, suppose a flight does last several days. The pilot has been in on the start and knows if there is something doubtful moving in. He checks the Weather Bureau closely so that he can cancel a flight, if necessary, far enough ahead to get the passengers on a train or arrange for other means of transportation.

Horton (Sinclair Refining Co.): There is wire coverage for all weather circuits

at the operations building at the Westchester Airport. In almost all cases we start as Mr. Teel said, checking the weather at least a day in advance if there's any question whatsoever on it, and if necessary, three or four long-distance phone calls to the Weather Bureau to get what we want. One disadvantage at Westchester County Airport is that there is no U.S. Weather Bureau, and we do not have a weather map to look at. Other than that, we have been operating with the U.S. Weather Bureau for well over ten years and have been quite satisfied with their cooperation and service.

Spengler: You say you check a day in advance if the weather is questionable. You mean from their state forecasts that might indicate that the weather is going to be bad?

Horton: We're getting into passenger personalities here. There are some pas-

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sengers who, if a pilot will go, they are perfectly happy to go. Some passengers are a little more particular and want to know the advance weather. These passengers might want to know the night before what the weather is going to be. Normally, it's a case of taking a look at the teletype sequence, U.S. Weather Bureau forecast . . . 12-hour, 24-hour, regional, whatever is necessary to follow through on . . . and just following the weather as you see fit. Sometimes it takes far closer checks than others.

Spengler: I understand you, Mr. Hopkins, take a private service?

Hopkins (American Can): Our reason for subscribing to a private weather forecasting service is the peculiarity of a portion of our operation which calls for two trips a week into an airport located in the mountains with poor let-down facilities. We require VFR



OUTBOUND TRIP is most important, as far as we're concerned, Hopkins, left, said as Bud Lacey jots down a notation.

weather for these trips. We also want a forecast for the trip two days prior to departure. If the trend is unfavorable, we back up the trip with other means of transportation. We have other trips departing New York, probably averaging three flights per plane per week. We have found the U.S. Weather Bureau personnel to be reasonably accurate, but they cannot furnish the two-day prior forecast and are apt to be extremely busy. The private weather service gives us most of the advantages of airline type weather service at a fraction of the cost. I think we all agree that a pilot can't know too much about the weather. I particularly enjoy flying weather, but I want to know the situation as far as possible before I point the airplane into it.

Campbell (National Lead): We've just recently started with Northeast. Being at Bridgeport we don't have U.S. Weather Bureau service available between 11 o'clock and six in the morning which is quite a disadvantage. Some of our passengers do not care to fly weather, and if we have a trip early in the morning it's a little difficult to know. I think with private service we'll be able to call at midnight or three or four in the morning, if necessary, to determine if we can go.

Spengler: This leads right in to the place of the Weather Bureau and whether the tendency for cutting down service might be even more so in the

future. Can you throw any light on the subject, Art Peterson?

Peterson (U.S. Weather Bureau): The basic questions directed to the Weather Bureau are how far should they go? And how far can they go? You undoubtedly realize there's plenty of room for answers to these questions. In the early days, back in the early '30s, there was no question as to how far the Weather Bureau should go. They were the only ones in the business of serving general aviation. The meteorologists of those days found they had to get out and fly with the pilots to learn the problems of aviation weather. Then the evolution set in of shifting Weather Bureau city offices to airports. Now, most of our offices are located at airport installations. They have a dual capacity of serving the public and aviation. In the years just before World War II, the Weather Bureau was still in about the same position of being the only source of weather service for the business pilot. Airplanes of the time however had their own forecasting services because they found it advisable to supplement the routine services of the Bureau. They continued to supplement through the war and some carriers still do.

When we consider how far the Weather Bureau can go today in furnishing the pilot with what he needs, I think we come up with quite a different answer. Here are some figures which illustrate the trend in recent years. In 1949 we had a total of employment in our operational work of about 4,500 persons. Now it's about 4,235. At one point we reached a low of 3,600 employees. In 1949 there were 399 Weather Bureau field stations. Now there are 314 including City offices. The curve of the Weather Bureau's service capability has gone down, and just now levelled off, while the curve of aviation growth, particularly business flying, has skyrocketed. To answer the questions How far can we go? or Should we go? we might resolve it this way . . . that we still have in the Weather Bureau the basic job of providing the fundamental pipeline service for weather information of all types—a wholesale or pipeline operation, if you want to look at it that way. But when it comes to the job of retailing or operating service stations on the pipeline, it no longer looks as if the entire job should be ours. We are not in a position to provide routinely an individual, specialized service such as many business pilots need. We've just heard Mr. Hopkins say that he wants an outlook two days in advance. Routinely we provide an outlook 24-hours in advance, in general terms.

In summary, the Weather Bureau as a pipeline service provides basic weather observations, analyses and forecasts for aviation in general. Where individual service for specific flight operations is needed, private weather organizations can fill a great need.

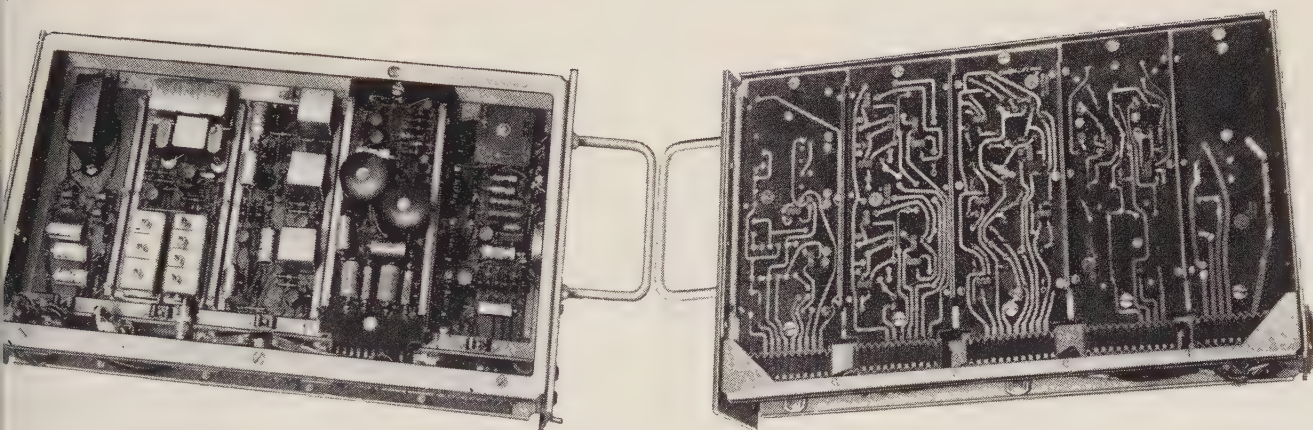
Spengler: To complete the general picture, I wonder if you, Mr. Denardo, (Continued on page 48)

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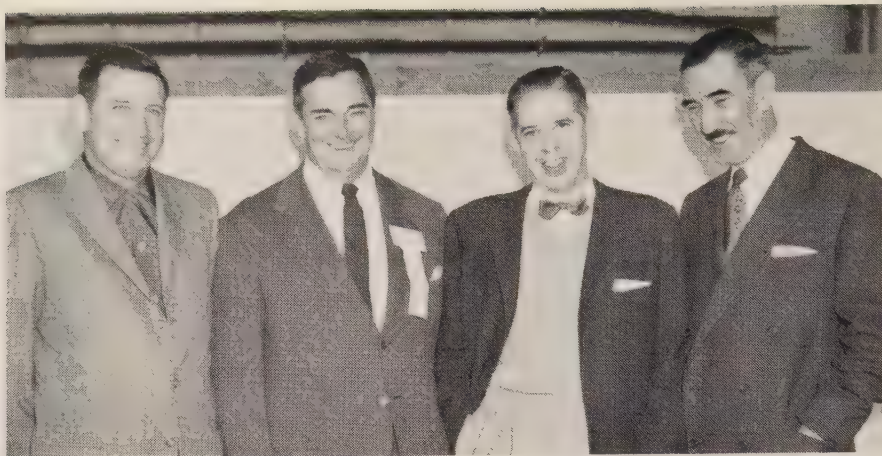
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SMILES PROCLAIM receipt of CAA certification for Alti-Cruiser. From left, C. E. Junker, CAA; G. L. Pew, Aero Design president; L. R. Smith, v.p., research and development; R. J. White, v.p., sales. Plane is new pressurized, supercharged model.

Aero Commander "Breaks Altitude Barrier"

Aero Design's new Aero Commander Alti-Cruiser, pressurized and air-conditioned, was revealed for the first time at a press showing at the Bethany, Okla., plant in conjunction with its annual distributor meeting last month.

Answering the cry for "above the weather" flying, the Alti-Cruiser, scarcely distinguishable from its parent plane, offers the comfort of pressurization flying to passengers as well as crew and the safety and capability of getting through and above icing level with the wing and empennage de-icer boot installation.

Pressurization proved to be the major need in a recent survey of the petroleum industry's use of business aircraft.

Aero Design's Alti-Cruiser is the first practical answer to this problem and in an airplane designed to meet it.

The cost of rebuilding or "adding" such capability into an existing airframe precludes any probability that there will be much competition until an entirely new airframe appears.

The automatic cabin pressure control by Airesearch is capable of maintaining an altitude differential of 5,000 to 7,000 feet, enabling a comfortable, physiologically safe cabin at 9,000 feet and, when necessary or desirable, to fly at 15,000.

Stratos Division of Fairchild Corpo-

ration built the hydraulically driven single stage centrifugal compressor. They also are responsible for the Turbine Bootstrap cooling unit which copes with the air temperature rise associated with any air compressing. This also provides the only real air conditioning possible in low altitude and ground summer operations. Even without the familiar ATC delays, high density terminal airport delays in CAVU can suffocate sweltering passengers. Aero Commander claims the capability of a 50 degree drop and up to 13,500 BTU per hour. Of course, heating capabilities of the same system are better than any comparable ordinary system.

Three radio packages give the buyer a choice of equipment. Shown in the demonstration model was the Wilcox CANARI system.

The cabin pressure is completely controllable by the pilots and can be adjusted automatically to provide any desired rate of altitude change up to 2,000 fpm. This effectively unties the pilot's hands with respect to the obvious advantages in many high rate altitude changes otherwise denied non-pressurized aircraft, especially in congested airway situations. It can be imagined readily that Commander crews will take to filing "pressurized" in flight plans to reap benefits previ-

ously harvested only by aircarrier crews.

Day prior to the un-veiling a mishap occurred in which the new model was damaged. Cause of accident was traced to faulty fuel gauge.

Presentation of CAA Certificate of Airworthiness was made by C. E. Junker to Ted Smith, vice-president, research and development, of Aero Design and Engineering Co.

Price tag for the complete model is \$183,750. The company anticipates delivery of at least 50 planes this year.



R. J. WHITE receives gold plaque signed by Aero Commander dealers with special record-song by Commandair's Nesbitt.



ALTI-CRUISER, Aero Commander pressurized executive light twin.



PRODUCTION LINE of Aero Design & Engineering's Alti-Cruiser.

Suite 344

Your Board of Directors held the December Board Meeting at National Headquarters and afterwards attended the Wright Memorial Dinner. Those present: Joseph B. Burns, President, representing The Fuller Brush Co.; M. Beattie, General Electric Co.; J. Bergesen, Ford Motor Co.; James Metner Jr., Texas Eastern Transmission Corp.; Ralph E. Piper, Monsanto Chemical Co.; Robert C. Sprague, Jr., and John Winant, Sprague Electric Co. Due to the busy schedule of Bob Sprague Jr., board member representing Sprague Electric Co., he regretfully resigned from the Board—you know Bob was awarded the Sloan Fellowship for a year's study (from June, 1957 to June 1958) at Massachusetts Institute of Technology as a candidate for a Master of Science Degree.

John Winant, Asst. Director of Employee and Community Relations, Sprague Electric Co., was nominated as Director and also as Treasurer of NBAA until next Annual Meeting.

Harley D. Kysor, Aeronautical Consultants & Associates, Inc., who is preparing NBAA's recommended standards manual, was present at the Board Meeting with a copy of the manual for the Board's final decision.

MAILINGS—CAA proposed use of Greenwich mean time (GMT) for air traffic control communications (for member comments); Maintenance Bulletin No. 4; Memo to NBAA members within close operational range of Louisville, Ky., for the purpose of obtaining comments as to the aeronautical hazards that may be experienced by the construction of a television tower, near Townsboro, Ky.; Minutes of Tenth Annual Meeting; Flight Operations and Airworthiness Release No. 419—Uncontrollable "Stick" Forces; CAB's FAR Draft Release No. 57-27—Part I—Air Traffic Rules. (for member comments); Airworthiness Directive on Aero Commanders; Memo on Joint NBAA-CAA meeting on basic Air Route structure requirements through 1965 for CAA Region One; Flight Operations and Airworthiness offices; Look Ahead for 1958; NBAA's Directory of Business Aircraft revision forms (for execution and return to National Headquarters).

We are proud to report new members CLIFFORD B. HANNAY & SON, INC., Westerlo, N. Y., mfrs. of hose reels as related to fire, fuel oil and gasoline, LP-Gas and aviation industries. Dwight C. Hannay, treasurer, is NBAA's representative and Donald C. Jordan is chief pilot, operating Aero Commander 560; KENNETH STARNES AVIATION SERVICE, INC., Little Rock, Ark.—aircraft sales and service, radio sales and services, maintenance, charter and distributors for Cessna; Kenneth Starnes, president, is

NBAA Representative; Robert L. Copeland is chief pilot and Josh Lee, sales manager, is in charge of aviation activities; MARQUETTE METAL PRODUCTS DIV., Curtiss-Wright Corp., Cleveland, O., mfrs. of aircraft windshield wipers, textile spindles, rotary pumps, governor, precision spring clutches. J. W. Griggs, product manager is NBAA Representative; G. E. Bevis, gen. sales manager, is in charge of aviation activities.

Please keep National Headquarters informed of any changes of address, personnel, aircraft so that our records will be kept up to date at all times.

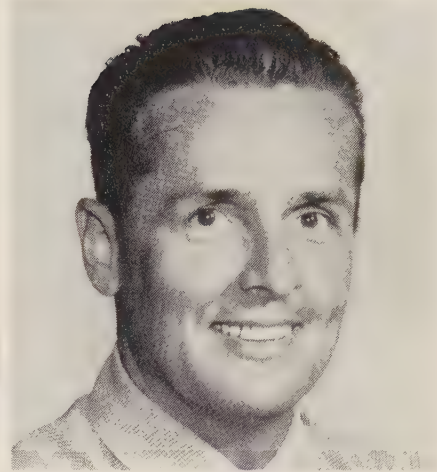
C.M."

NBAA Membership

Information regarding regular or Associate Membership in the National Business Aircraft Association is readily secured by writing to the Executive Director and Secretary of NBAA at 344 Pennsylvania Building, Washington 4, D.C.

Membership in this non-profit and independent aviation organization is based on the recognition of business flying problems common to all users of aircraft for their business purposes and to those engaged in supporting the operation, servicing, equipment, and manufacture of business aircraft.

Among the fields in which NBAA is concerned are: improvements in airways and airports, better weather service, expansion in communications and air navigation facilities, higher standards of airport services, improved aircraft parts distribution, equitable tax rulings for business aircraft operations, greater recognition of the airplane as a necessary tool in modern business and industry, better air traffic control procedures, professional status for qualified business pilots, and aircraft designed to meet the special requirements of business flying.



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A Tool Kit for the Chief

by Joe Bush

Businesses, big and small for years have turned to professional consulting firms for management assistance in finance, operations, distribution, sales and planning. Management uses consulting audit as a standard tool to gauge the effectiveness of all departments except flight.

Perhaps the intricacies and glamour of flying have tended to still the normally critical and roving eyes of most managements. Certainly the normal rules of management control do not often apply to the flight departments.

This sense of flying being a thing apart can have its drawbacks, particularly when it is coupled with the many other factors normally involved in interdepartmental and employer-employee relationships.

This is no attempt to tread upon that always dangerous swamp of generalizations, but there is every reason to believe that business flying could benefit materially, both from the management and flying standpoint, by the use of the same consulting tools that are used in other phases of corporate operations.

Management may not be aware of the growing number of business problems in business flying, but the corporate pilot certainly is, and it is to his attention that this is directed.

Most managements are familiar with and use consulting services of many types and so the introduction of such a service to assist in the operation and development of a flight department should not "raise an eyebrow."

Corporate flying is becoming more complex at an accelerating rate. Management does not realize that the pattern of business flights imposes a much greater demand upon the flying skills of the business pilot than airline flying does upon the airline pilot.

The operation of a single flight during inclement weather with important management personnel aboard places heavy responsibility for piloting, scheduling, dispatching, communications and ground handling on the shoulders of the pilot. Have you, as a company, overextended this man? Have you, as a pilot, accepted more than your share because of pressure?

This diverse and non-repetitive pat-

tern of flying is becoming more complex as more and more airways near the saturation level of our air traffic control system. This growing congestion creates a need for improved aircraft instrumentation and more versatile and accurate communications equipment. It doesn't stop there, for improved aviation equipment will not overcome all the deficiencies of our airways, and so it becomes necessary to turn to aircraft with more range to assure maximum protection under IFR conditions.

The demands of management for faster and more dependable service can only be met by larger, more complex and, therefore, more costly aircraft. No need to recite here the manner in which management is leaning upon its air arm to assist in maintaining control of far flung business. The yearly growth of business flying is evidence enough. This ascending spiral of greater utilization, longer, more diverse flight patterns, increasingly complex instrument flight operations, more complex and costly aircraft, obviously places a heavy burden upon the chief pilots and managers of business flying departments.

Can your company effectively evaluate the pilot requirements for equipment transition? Can you, as a pilot, adequately present non-technical management with a required program without personnel criticism?

There are many areas of business flying requiring planning and study. There are, for instance:

1. Study and selection of new aircraft with each item possibly costing as high as \$1,000,000
2. Coordination of dispatch and weather requirements
3. Development of procedures and manuals for flight and maintenance
4. Development of communications patterns
5. Organization of base and en route maintenance systems
6. Provision programming
7. Maintenance of crew proficiency
8. Development of cost control systems and operational forecasts.

A corporate flying department is a small airline and exposed to the same

problems as an airline. There is, however, with one or two exceptions, no parallel to be drawn between the airlines' departmentalized approach and the average business flier's approach to these problems. It is obvious that business flying is becoming to complex for a "one man band" type of management. A chief pilot owes it to himself and to his company to secure qualified consulting assistance in the resolution of many problems.

If, as this article has previously indicated, business flying even in the small fleet is more complex than airline scheduled flying, then certainly the safety of the almost irreplaceable management talent who are the passengers deserves every protection. Check and re-check as is good airline practice.

It is not enough to know that you have expert crews manning your fleet and the best mechanics maintaining the aircraft. There must be such procedures as will insure uniformity of performance both in the air and on the ground. These procedures set forth in manuals become the controls that safeguard the business flier, the chief pilot and management itself. They also can serve on the rare occasion when *anxiety to please* shades otherwise conservative flying judgment.

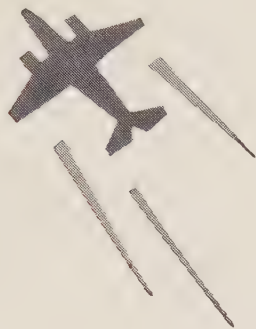
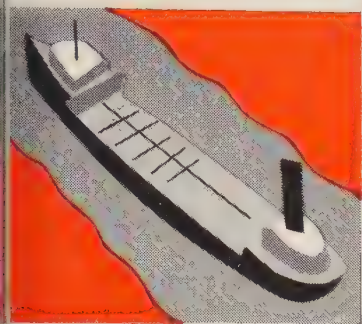
Assuming a procedural system to match today's flying requirements, there is also urgent need for a chief pilot to organize and protect his flight operations to a much greater extent than is now common practice. Greater protection for en route flying is badly needed and this can be achieved only by better flight communications and en route reporting procedures.

The development of suitable, yet low cost, communications is not something that you, the pilot, can establish at some airport while waiting for the Executive Vice President.

Included are the problems of maintaining communications with Air Traffic Control Centers and securing late and pertinent en route weather information.

If, in addition to a full stint of IFR flying, our typical chief pilot has tried to do something about his procedures

(Continued on page 50)



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New Cessna Business Aircraft In Mass Fly-Away



SOME OF 100 SKYLANES delivered to dealers and distributors at press showing, mass fly-away at Cessna's Wichita, Kan., plant.

L leading the line of 1958 Cessna models is the new Skylane shown to the press at a special gathering just before the first of the year.

The Skylane made its first public appearance last month at a series of new model showings by dealers across the country.

Anticipating an even greater sales for 1958 than the \$70,049,431 last year, Frank Martin, Cessna's marketing manager of commercial aircraft, told the assembled press that the firm expects to lead the business aircraft industry in both units delivered and dollar volume. Cessna delivered more airplanes than any other manufacturer in 1957. Martin said, adding that they are "shooting for more than 50 percent of the total industry business in 1958."

The new Skylane, a pushed-up version of the 182, is the result of popular demand for something a little more than the standard 182.

Priced at \$16,850, the Skylane (Skyways is pleased at having the model practically a namesake) will include a choice of Lear or Narco omni-transceiver with crystals and low frequency range, direction and horizontal gyros, sensitive altimeter, clock, outside air temperature gauge, rate of climb indicator and turn-and-bank indicator.

Appearance of the plane is "prettied up" with wheel pants ("speed fairings") on main gear and nose wheel, tinted window glass, interior upholstery in exotic colors (Sahara Gold, Ankara Copper) and new exterior paint styling and choices of colors.

Directional trim control is the greatest addition to the Skylane. It is located forward of the trim tab and flap control handle on the floor between the two front seats. The plane is already

known for its stability in flight, but addition of the new rudder trim means still greater stable characteristics. For extended cross-country flying, the directional trim permits the pilot relaxed pressures on the rudder pedals. In smooth air, it can be a no hands, no feet flight.

Other changes in the Skylane, the 180 and 182 models include a right exhaust outlet which forces the exhaust down the center of the underneath fuselage, eliminating metal stain and discoloration from exhaust gases; a new window seal for greater cabin quietness; new instrument lighting console package giving improved lighting.

Door lock has been relocated to the rear of the handle to prevent the door from being forced open when locked. On the panel, fuel, oil temperature and oil pressure gauges are grouped together. Tachometer and manifold pressure are standard size instruments.

Choices of optional equipment on the Skylane, 182 and 180 include the Tactair T-3 automatic pilot, available as a factory installation; an 18-gallon auxiliary fuel tank which can be installed in the baggage compartment; speed fairings, standard on the Skylane, are optional for the 182.

A Skyways' pilot flight evaluation report will be made as soon as the Skylane is available for that purpose.

Remainder of the 1958 line includes the 172, 180, 182 and 310B. A sixth model, to be known as the 175, will be introduced next month. Announcement of this model was made in Skyways last month.

Martin said of Cessna, "We have never before been so enthusiastic about our product line and the reception it has received from our field selling organization."



SPEED FAIRINGS on Skylane wheels give clean finish, add airspeed increasing by three mph 182 speed. Gear is standard.



INTERIOR decoration of new model features striking new color schemes. New In-gold fabric retains brilliance with wear.



INSTRUMENT PANEL includes standard equipment shown here plus directional trim control. Panel is black Royalite.



Vice President and Operations Manager Robert Angstadt reports, "We have been very satisfied with the Sapphire 1016."



CHICAGO HELICOPTER AIRWAYS equips fleet with

NARCO *Sapphire* 1016 RADIO

Operating scheduled helicopter passenger service between Chicago Midway Airport, O'Hare Field and downtown Chicago with an average of 5.3 landings per hour with each helicopter, the operation of Chicago Helicopter Airways, Inc., is one of the toughest tests imaginable for airborne electronic equipment.

For over a year Chicago Airways' fleet of Sikorsky S-55 helicopters has been operating with Narco Sapphire 1016 VHF communications units with 360-channel transmitter and 560-channel receiver. Satisfactory operation of the Narco 1016 led to selection of the same units for the company's new fleet of 12-passenger Sikorsky S-58's.

"We selected the Sapphire 1016," says Mr. Robert Angstadt, Vice President and Operations Manager for Chicago Helicopter Airways, "after considering factors of form, performance, weight and cost. We found the Narco 1016 offered a great deal of flexibility in communications for the dollars involved. We have been very satisfied with the operation of these units."

Some of the 1016's have flown well over 1,000 hours in the Chicago helicopters, averaging 15 frequency changes per hour—a gruelling test, and proof of the Sapphire 1016's stamina and ability to perform under the toughest possible conditions of vibration and continuous operation.

FOR MAXIMUM NAV/COMM FLEXIBILITY-NARCO *Sapphire* 1016



TSO'd for scheduled airline use. Provides automatic crystal-controlled operation (SCS or DCS), or independent transmitter and receiver crystal selection, with optional dual control heads. Receiver range covers 108 to 135.95 mc including all NAV frequencies permitting crystal-controlled NAV tuning when VOR/ILS NAV unit, such as Narco VOA-3, is attached.

Send for brochure and data on amazing new "2½ Sapphire 1016" system.

narco

MARK OF THE FINEST COMMUNICATIONS

National Aeronautical Corporation, Fort Washington, Pennsylvania

Sapphire 1016

90/360-CHANNEL TRANSMITTER
90/560-CHANNEL RECEIVER

PANIC or PANACEA?

How CAB proposals could affect your every-day flying activity.

By Gordon Edwards

Probably no phase of governmental activity applies more directly upon the "bread and butter" of all professional pilots than the rule-making activities of the CAB.

Except when an accident or some Specht-acular controversial issue makes the headlines, the general flying public relates the term—Civil Aeronautics Board—with the constant route and rate wrangles of the scheduled airlines. Yet, it is this body that creates the environment of everyday regulation by which and within which we fly. The CAB builds the regulatory structure which the more familiar CAA operates.

Hence, it is of paramount importance that every pilot using the airspace keeps well advised as to any contemplated changes in the regulations before they are written into law and thereby governing his daily operations.

Even before the dramatic mid-air collisions of the last few years, the majority of pilots have been concerned with increasing risks brought about by the increase in traffic and concurrent increase in aircraft speeds.

That various airspace user groups have had strong differences of opinion as to the cure is neither news nor cause for discouragement.

All interested parties are urged to examine and to comment on these proposed rule changes. The avenues of access are via NBAA, SKYWAYS, other civil aviation groups or, if you prefer, directly to the Bureau of Safety, CAB, Washington 25, D.C.

There are six primary areas of change.

First is an amendment to part 60.16 (c) Acrobatic flight . . . to be conducted only when visibility is not less than five miles.

By raising the present limits from three to five miles, the contention is that enroute traffic will have a better chance to see the acrobatic aircraft and be able to take precautionary deviations to avoid his general area.

It will impose an additional burden—but only a slight one—on the business pilot taking his instrument check flights which involve sudden and abrupt maneuvers. Of course, it may also impose restrictions on the pilot who insists on snap-rolling his boss while enroute to a business meeting.

VFR Minimums to Change

Second proposal is a reconstruction of current VFR minimums, Part 60.30. Here you will have to be patient and be sure to read all of the changes proposed and evaluate them as one "ball of wax," not just separately.

Except as provided in proposed revision of 60.31 "Special VFR minimum weather conditions in control zones," or unless a pilot holds a valid instrument rating, aircraft shall not be flown in weather conditions below those specified as follows:

Control zones with associated high density airports—1,500-foot ceiling and five miles visibility.

Control zones—1,000-foot ceiling and three miles visibility.

Distance from clouds in both these cases is the same: 500 feet under, 1,000 feet over, 2,000 feet horizontally.

Let's look at the "outs" for these ceiling and visibility restrictions in both types of control zones.

60.31, Special VFR minimum weather conditions in control zones says, when a clearance is obtained from air traffic control, a VFR flight in these zones (both types) may be conducted below the basic minimums as follows:

(a) *Visibility. Pilots shall not operate aircraft, other than a helicopter within a control zone when the ground or flight visibility is less than one mile.*

(b) *Clearance from clouds. Pilots shall not operate an aircraft within a control zone unless clear of clouds.*

Under these provisions the CAB says that "if traffic conditions permit, air traffic control will issue an air traffic clearance for flight within a control zone . . ." when the weather conditions are less than 1,500 and five or 1,000 and three depending on which type zone you are in. "However," says CAB, "no person shall operate an aircraft VFR, regardless of any clearance, unless the visibility is one mile and the flight can remain clear of clouds."

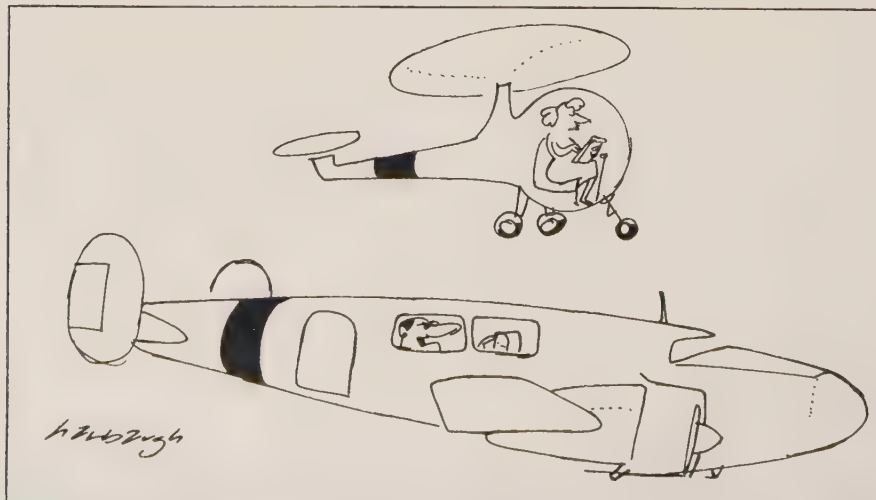
One joker raises its inquisitive head on reading the provision under part (a) that says "when the ground or flight visibility is less than one mile." Note that "or." What happens when the ground visibility is one-half mile, but the flight visibility, 100 feet above the ground, for instance, is one mile or more?

One more provision about flying in terminal areas, an amendment to Part 60.46 to read as follows:

Instrument Approach procedures. Whenever an approach to an airport cannot be initiated or continued in weather conditions equal to or above those prescribed for VFR flight, an instrument approach procedure prescribed and published for that airport by the Administrator or appropriate military authority shall be used. Unpublished instrument approach procedures may be used only when specially authorized in writing by the Administrator.

For example: an airport is reporting a visibility of less than three miles, but not less than one mile. Because of fog or smoke, an IFR flight may, after being cleared by air traffic control abandon the instrument approach procedure and proceed directly to the airport. Accordingly, whenever a pilot can make an approach to the airport remaining clear of clouds and maintaining one-mile visibility, he is not required to complete an instrument ap-

(Continued on page 46)

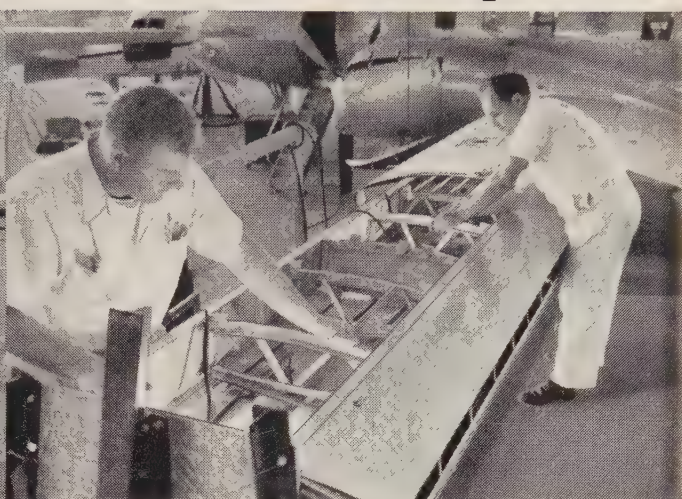


Miss Henley, take a letter to the CAB, please.

Better performance, comfort and appearance for your business airplane!



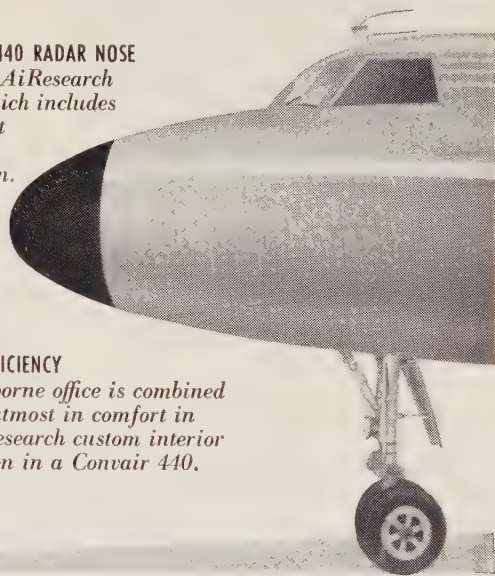
CONVAIR 240 INTEGRAL STAIR DOOR, an *AiResearch* modification, combines high efficiency with light weight and smart appearance.



INSTALLATION OF WING TANKS by *AiResearch* brings capacity to over 2000 gallons, adding extra hours to range of Convair 340 and 440. (Added fuel capacity also available for Convair 240.)



CONVAIR 340 or 440 RADAR NOSE is part of *AiResearch* conversion which includes radio, autopilot and new instrumentation.



MAXIMUM EFFICIENCY as an airborne office is combined with the utmost in comfort in this *AiResearch* custom interior conversion in a Convair 440.

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in conversion facilities,
workmanship and service*

The Convair conversions illustrated are typical of hundreds made on all types of business aircraft, including DC-3s, DC-6s, Lodestars and D-18s. A single visit to *AiResearch* Avia-

tion Service can solve any conversion, modification or servicing problem you may have.

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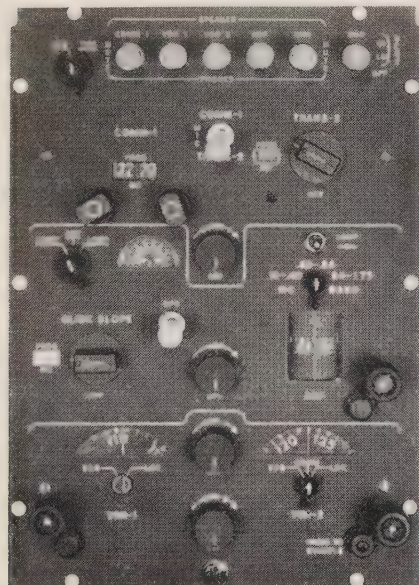
Conversion and Modification • Custom Interiors • Electrical and Instrument • Radio and Electronics • Engineering Service • Turn-Around Service

NAVICOM

ARC Introduces Two New VHF Systems

Two new VHF communications systems designed specifically for single- and for multi-engine business aircraft, are now in production at Aircraft Radio Corporation, Boonton, N. J.

Representing more than three years of research and development, the



larger system, the ARC 210, provides a frequency coverage of 118 to 135.95 megacycles on 360 channels.

Included in the total weight—an exact 22 pounds—are the transceiver,

mountings, control panel and power supply. The unit has true 50-kilocycle channel spacing, a 15-watt transmitter with a very low, spurious output and a receiver sensitivity of two microvolts.

By turning a switch on the control panel, the system can be operated either as a single-channel simplex or double-channel simplex with six-megacycle separation.

A feature of the new system is a control panel incorporating several innovations that will be welcomed by pilots. Large numbers showing the frequency selected are placed so they can be read in a normal left-to-right eye movement. And any possible confusion between the megacycle and fractional-megacycle functions of the transceiver is eliminated by separate knobs that can be operated with gloved hands. The entire panel is internally lighted for night and instrument flying.

The other system, the 1200 is a compact, glove compartment size package unit designed to provide the optimum in radio navigation and communication facility for single-engine personal business planes such as the Beech Bonanza. The 1200 includes an ARC T-20 transmitter, 20 VHF channels (118-127 mc), tunable VHF receiver with "whistle-thru" circuitry for precise tuning of communications frequencies. The latter also provides VOR and ILS localizer coverage with an IN-10 combined indicator and Marker Beacon Receiver. Then there is a Type 21 ADF with the same easy readability tuning

of the bigger 210 system. The F-13A speaker amplifier completes the package, making an extremely practical package for original factory installation or replacement of the all too familiar scattered-over-the-panel combinations of equipment that seem to grow like Topsy as business pilots satisfy the urge for more utility in their aircraft.

Beech Offers Autopilot As Optional Factory Equipment

The Tactair T-3 autopilot has been selected by Beech as optional factory-installed equipment on all 1958 Model J Bonanzas. The Tactair autopilot is manufactured by Tactair, Inc., autopilot division of Aircraft Products Company, Bridgeport, Pa.

The 9-lb. Tactair uses pneumatics, both for sensing of attitude changes and actuation of the controls. Using suction provided by the aircraft's vacuum system, the Tactair autopilot's especially converted directional gyro and artificial horizon sense attitude changes by means of variation in pneumatic pressure and relays this information to valves which regulate suction on bellows linked to the control cables. Slight attitude changes produce moderate suction on the bellows; larger displacement produces proportionately stronger action by the bellows. The system eliminates the characteristic "ON-OFF" action of electrically-operated autopilots and results in smoother application of corrective control forces.

Since the Tactair autopilot does not use electricity the system eliminates power drain, tubes and requires no warm-up period.

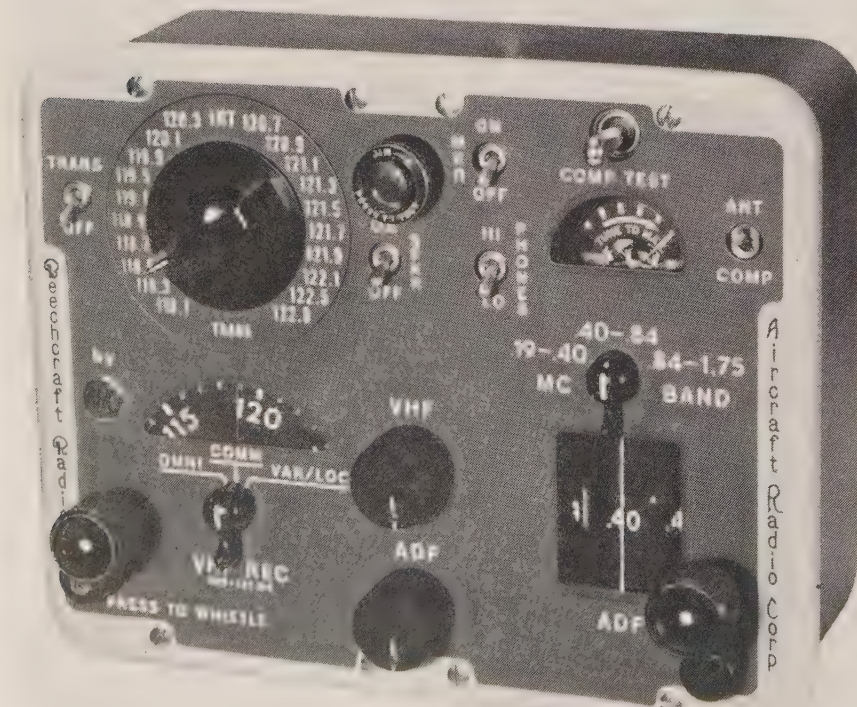
The Tactair is CAA certificated for installation in all Bonanza models (from the Model A on), and work is starting now to certificate the Tactair in the new twin engine Travel-air.

Airline Installs Sapphire 1016 In DC-3 Fleet

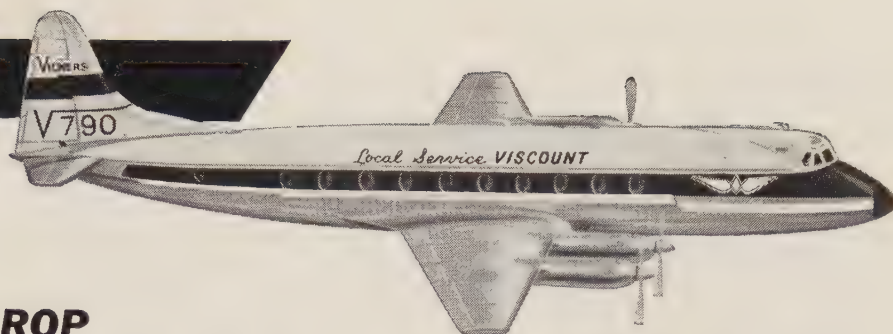
Capital Airlines has selected NARCO Sapphire 1016 Communications Units for installation in their entire fleet of 17 DC-3's. The order calls for equipment and spares to equip the entire fleet.

To evaluate the merits of the Sapphire 1016 (360 ch. XMTR-560 Rcvr), elected to make a test installation on a DC-3 Capitaliner, over and above the aircraft's standard equipment complement. After 900 hours of maintenance-free service, Capital decided that the Sapphire 1016 would adequately meet the requirements of their DC-3 operation.

The Sapphire 1016 unit weighs 28 pounds completely installed and can be remotely located in the aircraft's electronic rack.



Announcing...



THE NEW JET-PROP LOCAL SERVICE VISCOUNT

... a new short-sector aircraft to meet the high-frequency and economy demands of local service routes.

Proved Performance

Backed by over one *million* hours of world-wide operating experience with over 250 Viscounts. Performance-proved Rolls-Royce jet-prop "Dart" engines are unsurpassed for reliability and ease of maintenance.

Built-In Passenger Appeal

27 airlines report, "wherever the Viscount flies, traffic figures rise"—an average of 35%. Reason: jet-prop's smooth, silent speed and comfort. Viscount is the plane *more* passengers ask for by name.

High-Density Capacity

Accommodations for up to 65 passengers. Handsome interior furnishings are exceptionally hard wearing. Carry-on baggage racks are provided.

Low Operating Costs

As demonstrated by actual airline experience, Viscount operational costs are lowest of all modern 4-engine aircraft. The new local service Viscount will be highly economical even on the shortest routes.

Routing Flexibility

Can operate from 5000' runways (shorter with slightly reduced weight) ... can fly up to 5 short sectors without refueling or ground servicing.

Rugged Construction

In this Viscount development special attention has been paid to the conditions of low-level operation. The landing gear and systems operated in the landing and take-off cycle are particularly rugged.

Fast Turn-Around

Cargo can be loaded while #4 engine is running, driving generator and hydraulic pump, permitting internal starts ... underwing fueling (in addition to overwing) ... integral passenger steps hydraulically operated.

Further Information ...

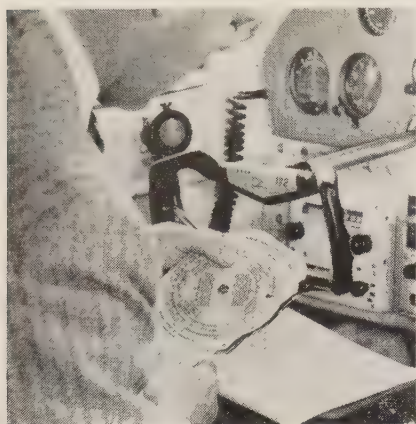
For a complete cost analysis of *your* specific routes by an experienced Vickers engineering team, call or write: Christopher Clarkson, U.S. representative, 10 Rockefeller Plaza, New York 20, N. Y.

FROM THE WORLD LEADER IN JET-PROP AIRCRAFT

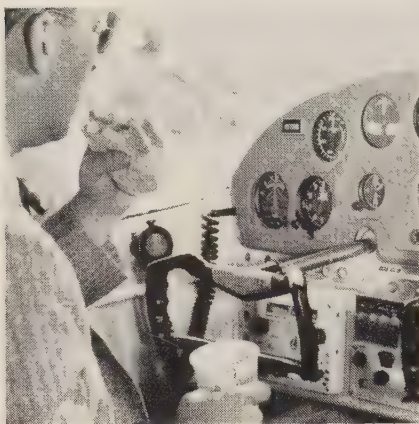
VICKERS **LOCAL SERVICE** **VISCOUNT**

POWERED BY FOUR ROLLS-ROYCE DART ENGINES

VICKERS-ARMSTRONGS (AIRCRAFT) LTD., WEYBRIDGE, ENGLAND • MEMBER COMPANY OF THE VICKERS GROUP



GROUND SPEEDS, fuel consumption and other computations are figured by the pilot who has freedom of the auto-aid.



TIME TO EAT with both hands, without balancing coffee cup on floor, or to relax a bit is possible while "George" flies.

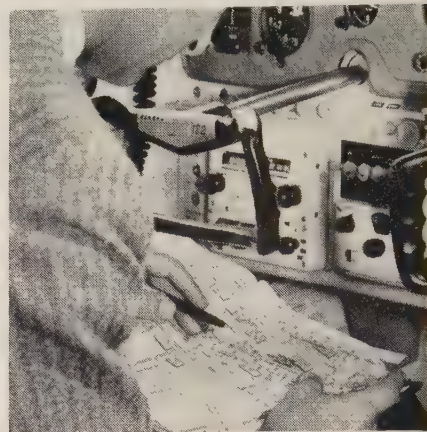
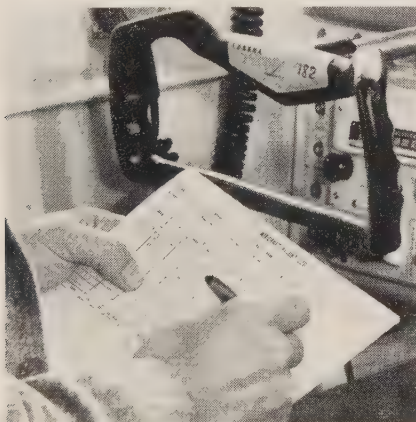


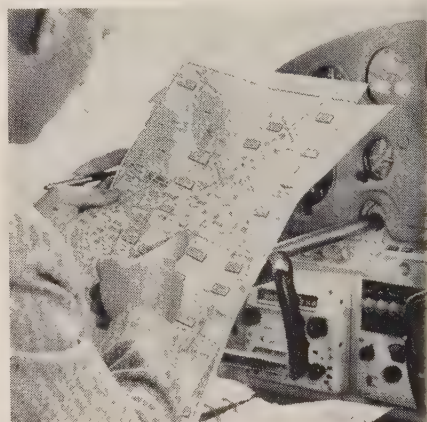
CHART STUDY, freedom to check radio facilities, Airman's Guide and draw course lines, etc., is possible with auto-pilot.



AUTO-PILOT frees hands to let pilot write notes, making log entries, IFR clearances, while the plane flies along by itself.



OPERATING RADIO is facilitated by the automatic device. Two hands are free to tune in stations and use the microphone.



FLYING IFR, auto-pilot gives pilot time for essential cockpit work. Photos are courtesy of Federal Tubeless Autopilot.

New Bendix Weather System Introduced

A colorful new "Weatherman" system that measures and indicates the speed and direction of the wind, temperature, relative humidity, rainfall and barometric pressure has been announced by the Friez Instrument Division of the Bendix Aviation Corporation.

The outside weather data is presented indoors on 11-inch-diameter color dials that can be flush-mounted. The installations are especially suitable for non-publicly owned commercial and privately-owned corporation fields or in undeveloped areas. The numbered scales of the indicators are covered with a fluorescent yellow paint, which also is used on the inner-scale graduations on the face of the dial. A fluorescent orange paint highlights the leading edges of the indicator pointer.

The basic Weatherman system, which also features remote operation—except for pressure—electronic amplification for temperature and humidity, and a single transmitter for wind speed and direction, consists of six units. However,

indicators and transmitters also can be supplied separately as individual units.

Optional accessories of the system include a special mast adapter for mounting the wind transmitter, a 28-foot utility tower for the transmitters, additional thermistor probes, and an instrument shelter.

Telephone Companies Vital Basis of Entire Airways System

The current high public interest in the improvement and expansion of our overloaded airways system has rightfully emphasized the important parts played by top notch ATC personnel, radio and radar facilities. Far too little has been said of the other vital link in the system without which all the foregoing would collapse, the very unexciting but completely necessary telephone systems services.

For example, in a long room in the CAA building near the Los Angeles International Airport a line of men in shirtsleeves, some with head-phones, some clutching telephone handsets, work feverishly at banks of air traffic

control boards. Outside, the California coastal area is blanketed under a thick bank of sea mist and night is coming on. Radio speakers squawk continually with pilots calling in "Los Angeles Center, this is Douglas 874 approaching Santa Barbara at 5,000, requesting further clearance . . ."

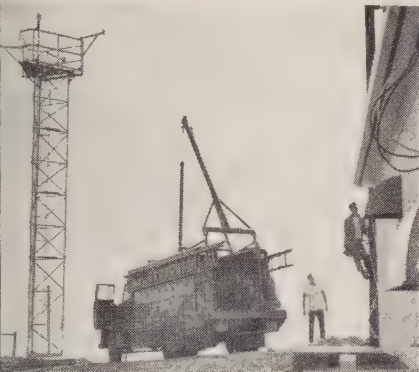
A row of teletypewriter machines spew forth charges of data. The line of shirtsleeved men, air route traffic controllers, manipulate the stacks of strip holders on the slanted boards before them, each strip holder representing an airplane, and speak intently into their microphones, passing on ATC instructions and information to the pilots miles away in the sky, in the night, in the fog and bad weather. Other controllers at the same boards, speak constantly into a battery of telephone switch-boxes giving and receiving similar information to dozens of control towers and operations offices and other centers in a wide radius of the southwestern United States.

The control towers are another adjunct to the vast network of radio and telephone communications that reaches across the country, terminating in the regional air route traffic control cen-

ters, to keep track of planes in the air and weather conditions everywhere at all times. Their entire system of telephone and radio communications rely on telephone industry land lines and interior circuits.

Radiating from the air traffic center, located in Pacific Telephone Company territory, are countless telephone lines leading to strategically placed air traffic communications stations and other contact points throughout a 250-mile radius. To and from all these installations flows a constant stream of air traffic data and meteorological information, which is coordinated and acted upon by the air route traffic controllers.

With more planes, bigger and faster, in the air every day, it is inevitable and essential that the CAA must constantly expand and improve its air traffic control facilities. The Los Angeles Center, a good example, is having more and better equipped relay points established around the periphery of its jurisdiction. A case in point is the La Cumbre Peak installation in the Santa



Barbara Mountains, which is to be linked with the General Telephone Company's Santa Barbara central office by means of microwave reflectors. The telephone industry uses microwave transmission to establish connections over terrain where the use of cable would be too cumbersome and too difficult to maintain. Since microwaves travel in a straight line, like a beam of light, transmission is effected simply by aiming one transmitter at another to establish connection.

By this means, pilots approaching Santa Barbara can get in direct contact with the Los Angeles air traffic control center by radioing to La Cumbre Peak, where the microwave installation will relay the call to the Santa Barbara central office and then carry it by private lines into the center. This setup will simplify and expedite communications in that sector.

NASAO Calls For Reversal of VORTAC Decision

The National Association of State Aviation Officials at its recent meeting resolved to urge tax relief for those privately-owned commercial airports which are providing a public service at no cost to the taxpayer. Recommendation will be made that the landing areas and improvements made on them

be exempt from all real property taxes, providing the airports are approved by authorized state agencies and are open for use by the general public without charge.

Among other actions taken by the group were: (1) Recommendation for raising the floor of controlled airspace from 700 feet to 3,000 feet, except in control zones, to permit visual air traffic to operate under the proposed five-mile visibility minimums for VFR flight on airways.

(2) Recommendation to the Airways Modernization Board to consult with NASAO and other national organizations for the purpose of revising and updating designs for airports for all classes of air commerce.

(3) A resolution to join with the ACC and AAAE in a nationwide survey to determine the extent and cost of needed airport development.

In discussing the recent "VORTAC compromise," which members feel threatens CAA's civil program to extend the AMB, the organization called for a review of the VORTAC decision to determine if there actually is an "impelling future military need" for TACAN and whether it would not be in the public interest to rescind the "VORTAC policy."

Claude B. Friday, Director of the Bureau of Aviation, representing New York State in the NASAO, is regional vice president for Region V, composed of the New England States and New York.

Army "Electronic Weatherman" Computes Winds and Weather Aloft

An "electronic weatherman," a wizard at figuring winds aloft and other vital high-altitude weather conditions, has been announced by the Army.

The new system spots high-altitude indications of oncoming storms, hurricanes, tornadoes and other bad weather far faster and more accurately than any previous device. It is the first system able to chart high velocity winds like the jet stream on a routine basis.

Developed by the U.S. Army Signal Engineering Laboratories at Fort Monmouth, New Jersey, the system reduces long, difficult calculations now required to interpret data from a weather balloon flight. It tracks the balloon and a built-in electronic "brain" does the figuring instantly.

Winds and weather high above the clouds have a profound effect on ground conditions. Inaccurate or delayed balloon reports often cause a forecaster to give false weather predictions.

Specially designed computers of the system work in conjunction with a three-pound weather station, called a radiosonde, carried aloft by a rising balloon. The tiny airborne device sends back coded radio signals, which are fed into the "brain." There they are processed and stamped out on paper as usable humidity, temperature, and pressure readings. A second high-speed

how much do you pay for engine service?



too much...or too little?

At Dallas Airmotive, the price you pay is for reliable engine overhaul. Once an engine has been disassembled at Dallas Airmotive, every minute part is carefully checked. If the part requires overhaul, then Dallas Airmotive's technicians rework the part. If the part is not suitable for reworking, then a new, guaranteed part is used in its place.

The price of good engine performance is never too much or too little. At Dallas Airmotive, the price is right and the product is a reliable, trustworthy engine



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computer calculates winds faster and at greater range than has ever before been possible.

The system can track a balloon to an altitude of 24 miles or higher with its radar-like antenna, which follows on the balloon's radio signal automatically. It tracks the balloon precisely, even if it drifts 200 miles from the launching site—twice the effective range of previous equipment.

Wright Announces New Remote Control Unit

Addition of a REMOTE-CONTROL unit, the Custom Remote, to the Wright Airborne Electronics line of executive aircraft transceivers has been announced by Gary Wright, president of the electronics firm. Available with either dynamotor or transistor power supply, the 90-channel Executive Custom Remote comes complete with antenna, crystals, shockmounts, and dynamotor or transistor. The remote control unit sells for \$1,295.00 with standard dynamotor power supply.

Characteristics of the Custom Remote Receiver section include 2-micro-volt signal input for not less than .5 watt audio output, 2.5 watt minimum audio output, and at least 25 D.B. attenuation of adjacent 100 K.C. channels.

Of particular interest to installation personnel is the unique use of a barrier

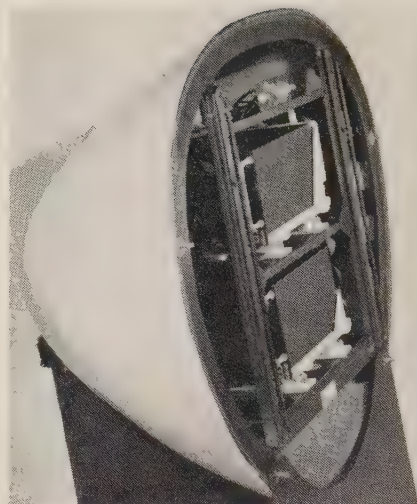
and fanning strips on the bottom of the shockmount, which makes it easy to connect the Custom Remote to aircraft wiring and remove it for bench checking.

New Radome "Package" Systems Facilitate Installation

A new development at CAIR (Chamberlin Aviation, Inc., Akron, Ohio) incorporates the AVQ-50 Radar in the DC-3, Lodestar, D-18, E-18 and Beech Model 50 radomes. The CAIR 2005X-R AVQ-50 Radar package consists of the antenna, transmitter-receiver and accessory unit all installed in the DC-3 radome, completely wired and checked out. It also includes the indicator and a partially built up control completely wired and including all necessary interconnecting cables for the system. This new package makes possible a complete radar installation in a DC-3 within five (5) working days. It carries a CAA Supplementary Type Certificate (S.T.C.) number, #SA1-63.

The 2001X-R Aero Commander radome has been installed and is now undergoing flight testing. This new kit has been developed to provide the installation agencies all necessary peculiar parts as well as complete instructions for the installation of a smoothly faired radome on the Aero Commander.

The 2002X-R Beechcraft Model 50 Radome Kit is still in process. The first



radomes have been completed and are now in the process of making the first installation in order to obtain CAA Supplementary Type Certificate approval. This radome kit, like the 2001 series, provides heater air inlet and a smooth fairing to the contour of the airplane.

The CAIR 2006X-R Lodestar package is now in process. It will provide a radar package very similar to the DC-3 package. This is essentially a complete radar system installed in the radome and providing a light-weight, easily installed radar for the Lodestar.

The 2000X-R Beechcraft D-18 AVQ-50 Radome Kit has been completely



all in the 1958 MARK 20

more power greater speed

greater climb less take-off distance

more room greater comfort

Yes, the 1958 MARK 20 is the plane you have been asking for... a really advanced-design four-place plane that provides high performance at low cost.

NEW for '58 is the Mark 20 A with a 180 h.p. engine by Lycoming—the famous name of all aircraft engines.

NEW... cruise at 180 m.p.h.

NEW... climb 1200 feet-a-minute.

NEW... more room for every passenger... insuring perfect, relaxed comfort for all.

NEW... shock mounted IFR instrument panel.

NEW... accessory equipment hatch.

Seeing is believing and flying a Mark 20 is the clincher! YOU be the judge... compare and discover... the Mark 20 for 1958 is at your distributor now. For information write:

MOONEY AIRCRAFT inc. Kerrville, Texas

NEW CONCEPT IN AIR TRAVEL BY HERTZ

Nationwide Rent A Plane Service!

(WITH OR WITHOUT PILOT)

SERVICE BEGINS SOON IN KEY CITIES COAST TO COAST!

Soon businessmen and vacationists will be able to rent a plane from Hertz—to enjoy the same convenience and flexibility as when they've rented Hertz cars. Hertz will provide experienced pilots (charter service) or, qualified pilots can fly themselves. Travelers can fly via airline to the major city nearest their destination—fly via Hertz the rest of the way. Reservations can be made by calling any of the over 1500 Hertz Rent A Car or Hertz Rent A Plane offices listed in alphabetical phone books everywhere.

Qualified organizations—aircraft dealers,

charter or air taxi and fixed base operators, etc.—are being appointed as Hertz Rent A Plane operators. Franchises are made available to operators who provide current model aircraft according to Hertz System specifications for the finest in safety and communications equipment. The planes and operational standards far exceed CAA requirements for maintenance and safety. Pilots, mechanics, and other personnel must be experienced and fully certificated.

Look for the inauguration date of Hertz Rent A Plane service to be announced soon in national magazines and newspapers.

**A few Hertz Rent A Plane franchises
still available for selected operators**



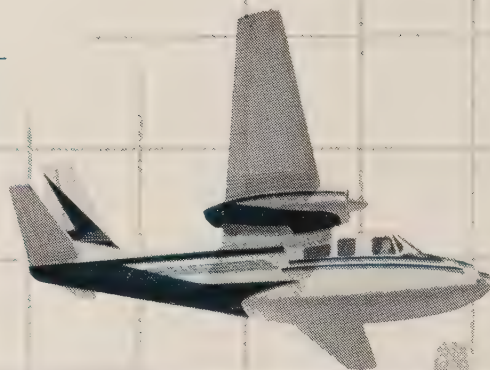
FOR INFORMATION CALL OR WRITE:

Hertz Rent A Plane System

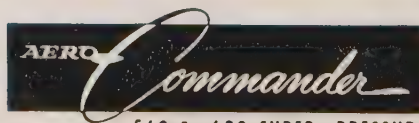
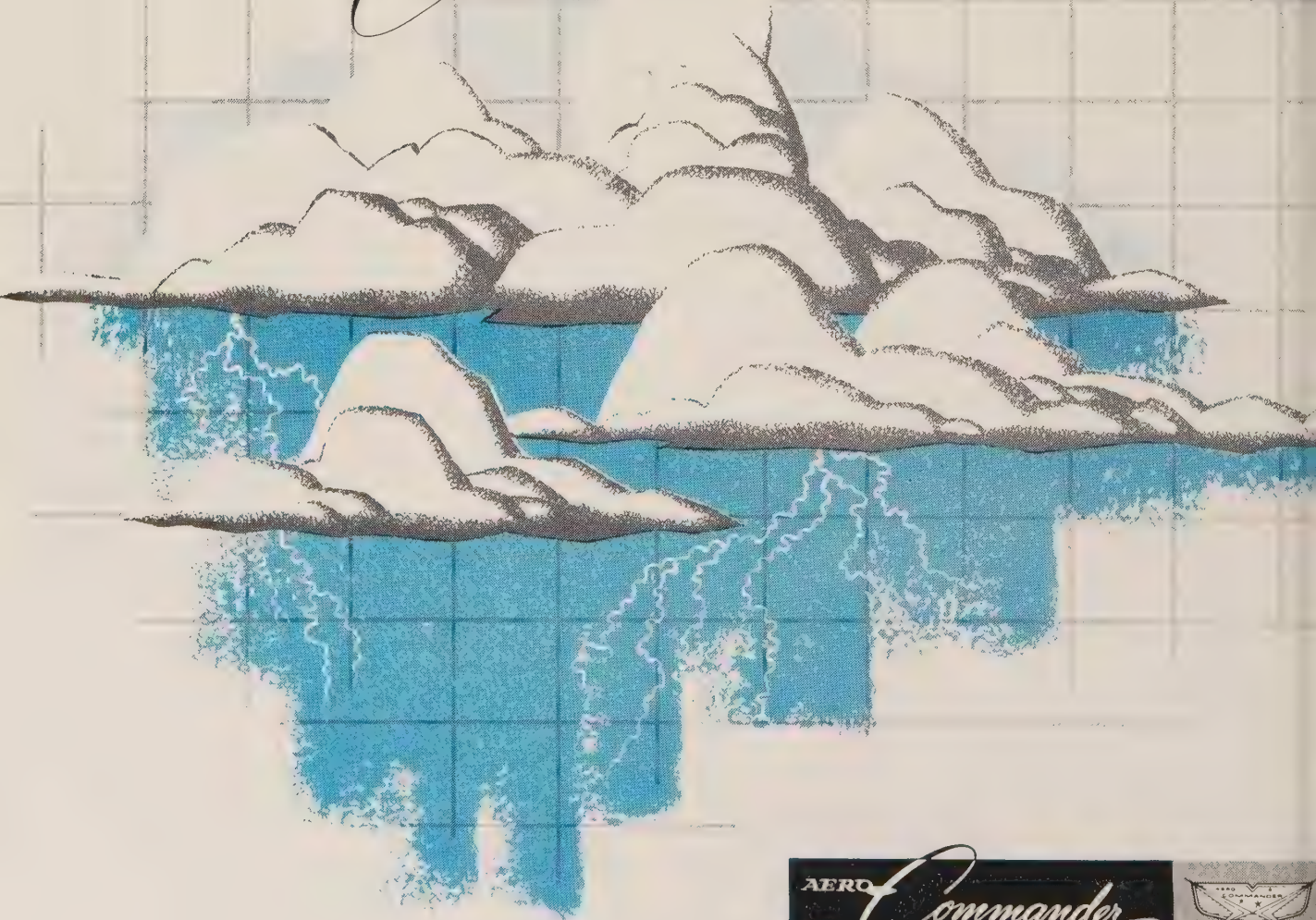
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HIGH COMFORT



AERO *Commander* presents the world's first



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Airline-type pressurization in the new Commander Alti-Cruiser makes altitude flying a comfortable reality in executive aircraft. The Alti-Cruiser heralds a new era of utilization for the company airplane! Favorable cruising altitudes can be maintained in complete comfort—without oxygen masks.

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At 15,000 feet, the pressurized, supercharged Commander Alti-Cruiser delivers maximum cruise performance with economy of operation. And yet, passengers enjoy the comfortable cabin altitude of an airplane flying thousands of feet lower.

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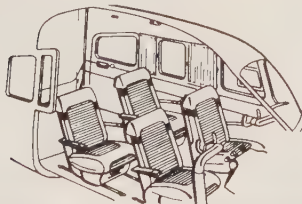
THE NEW
SUPERCHARGED
AERO

Commander ALTI-CRUISER

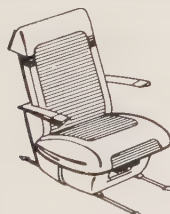
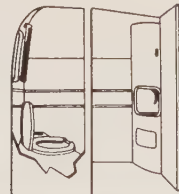
With All-Weather Air Conditioning

**OPTIONAL LAVATORY COMPARTMENT AND
EXCITING NEW INTERIORS**

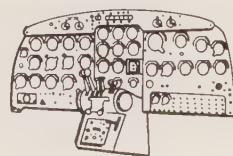
Flexible seating arrangements—
4 to 7-place.



Complete lavatory compartment
—optional



Deluxe airline-type reclining
chairs with tuck-away arm rests.



New control quadrant and panel
for greater operational efficiency

Write for
Aero Commander's new
"Tailored for Business"
Lease Finance Plan

approved under CAA S.T.C. #SA1-102. This kit includes a hinged radome for the D-18 and includes a Hartzell latch as well as a bulkhead for mounting the AVQ-50 antenna.

The CAIR 2003X-R Radome for the Beechcraft E-18 is a slightly different approach. This radome is directly interchangeable with the late model E-18 plastic nose and is secured by the same hardware used originally by the airframe manufacturer. The mounting of the antenna is left up to the installation agencies and it is felt that this installation can be approved on a Form 337 under S.T.C. #SA1-135 for a list price of \$980.00. (This price is based upon returning the original E-18 plastic nose assembly to CAIR.)

Super Arcon, "No Limits" Operation

An important aviation "first", winning for the Lear Super Arcon (Automatic Rudder Control) CAA certification with no limits as to phases of aircraft operation during which the Arcon may be engaged, is claimed by Lear Inc., Santa Monica (Cal.). The Arcon may be utilized at any altitude above the ground and even during take-offs and landings. Automatic flight control devices are usually placarded against operation below a stated minimum altitude, generally not less than 200 feet above the terrain.

Lear points out that a device which gives an airplane positive lateral stability becomes, in an emergency, an important safety factor, and, therefore, should be a device that a pilot cannot inadvertently leave turned off. The Super Arcon's only provision for disengagement is a spring-loaded button mounted on the control wheel of the airplane, which must be held down to de-activate the system and which, when released, automatically reactivates it. Thus, if in difficulty, the pilot has only to release the controls to have the airplane automatically return to straight flight—or straight take-off or landing run.

The Super Arcon's value during single-engine emergencies was demonstrated to CAA in a Piper Apache by simulating engine failure immediately following take-off. When power of one engine was suddenly cut back to idle, the Super Arcon prevented any abrupt yaw and, with the engine windmilling and rudder untrimmed, allowed only a very gradual turn toward the "dead" engine. With the engine feathered (rudder still untrimmed), yaw was eliminated entirely.

Initial CAA Supplemental Type Certificate numbers issued for the Super Arcon cover Piper Tri-Pacer, Piper Apache, and Beech Bonanza models A-35/H-35, inclusive. Demonstrations for certification in other leading makes and models are scheduled for the immediate future.

New Collins Line Features Broadened Utility

Average owner/operator of many business aircraft in the light-twin, high-

performance, class and some earlier medium-twins, has long faced a problem of rapid obsolescence of high spec radio equipment. This is primarily due to the switch from most airline type equipment to the higher voltages.

Although there are a few manufacturers who have included ARINC spec equipment in their low weight, low cost lines, the field has been relatively small and the line of divergence between 12 volts and higher has effectively limited the choice of the buyer in this class.

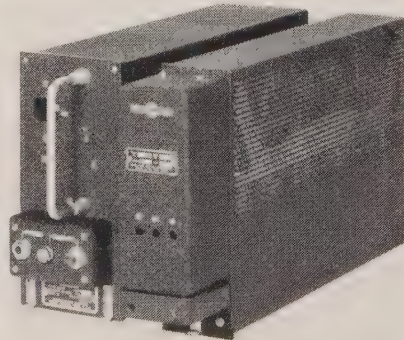
To overcome this objection without the customary great weight penalty, Collins has introduced a seven pound, transistorized power converter, the 516G-1, which allows aircraft with 12 volt systems to be fitted with the new lightweight, airline 27.5 volt equipment. The 516G-1 provides ten amperes at 27.5 volts continuous service and 15 amperes for intermittent service. There are no moving parts, no special cooling requirements and preventive maintenance is eliminated.

Along the same line of customer-conscious, practical engineering and ease-of-installation thinking is the new Collins 1958 Navigation Receiver trio, consisting of the 51R-4 Receiver, and the VOR-101, VOR-102 optionally-packaged radio systems.

The 51R-4 utilizes the modules of the Collins 51X-2 receiver and the 344B-1 VOR/LOC Instrumentation Unit, thus providing 880 channels with 50 kc spacing in a one-half ATR case, total weight 23 pounds.

The VOR-101 splits the modules of the 51X-2 and the 344B-1 into two short three-eighths ATR cases weighing a total of 24 pounds but increasing the installation versatility. A Servo Amplifier for driving an RMI compass is integral to the 344B-1 and 51R-4.

In the case of the VOR-102, the 51X-2 is combined with a 344A-1 which



uses only part of the modules of the 344B-1 and is cased in a short one-quarter ATR box weighing only nine pounds, for a total installed weight of about 20 pounds less shockmounts. This combination would be used where VOR deviation indicator service is desired without an RMI, saving cost and weight.

This equipment carries on the design philosophy inherent in Collins' new line of lightweight multi-channel communications equipment emerging this year and causing a considerable stir in business flying circles.

Greenhouse Patter

By "Torch" Lewis

WHITE PLAINS: Miami bound. Weather Advisory service says "stay inland" (Victor 3) to avoid active cold front lying along coastal route (Victor 1). Filed Victor 3, worked out navigation to third decimal place. Taxied out and waited . . . and waited. Clearance. Yep, that's correcto. Victor 1 and jes so they is no chanct of missin the weather you'd best go east to Bridgeport, climb to 10,000 and head for Atlantic City.

Well suh, by Norfolk the ol eyeballs were uncaged and tumbled, the pasajeros were not even speakin to us and all in all it was one of those nights where you feel mebbe I should have taken up obstetrics or animal husbandry.

Then ATC, with an unprecedented display of compassion, rerouted us to Victor 3 and we popped out of the maelstrom forthsweet. No particular moral, except always plan to get the worst routing and altitude possible, then if anything different happens, it can only make you feel better. Hate to work out the consarn navigation then do it all over staying one check point ahead of ATC.

MIAMI: Logged in at 2345 after spending 30 minutes tryin to find L. R. Smith's new facility. Finally got out and found it, and it's great. Good facilities backed by good craftsmen. Herral Bellomy, Exec Veep and transplanted Texan, makes with large hello but won't stay out on ramp long because temperature is 50 degrees. U ketchup-blooded nawthuners are getting into shorts and polo shirts as this is heaven compared to the Lower Slobovia we have recently left behind.

Dispatch Service, Inc., fixed us up with liferaft, jackets, clearances, manifests and other paraphernalia necessary to travel the islands. Patrol leader of these beavers is Al "Thimblebelly" Schwartz who has forgotten more about such things than we'll ever know. Very handy people to know if you have an out-of-the-country flight from Miami.

HAVANA: Well, at least it's 65 degrees here. They hasn't forgotten how to charge, howsomever, because by the time we drew up under the porte cochere at the Nacional we were out eighty clam. By the time the baggage men, porters, bellboys, room boys and other harpies got unhooked it was getting ridiculous.

This is the softening up process for the croupiers who will take the biggest piece if you have a weakness for the green felt. Wilbrod forgot to bring our eyeshades so we eschewed the galloping dominoes for succulent Moro crab. CINCINNATI: Passed up Sunken Lunken for Greater Cincinnati and my how things have changed. Cordial John Hedrick of Boone County Air Service now has wall-to-wall cement all the way from hangar to terminal. They serve a pretty fair meal at the airport beanery, a rarity in this business. Someday, gonna have a contest to find the worst.

SAFETY EXCHANGE

"Saf-T-Matic" Restraint System Provides Practical Protection

The emergency restraint system unveiled by the Pacific Scientific Company of Los Angeles introduces an entirely new concept in flight personnel protection. Called "SAF-T-MATIC", it is the first completely integrated restraint system developed for commercial use.



Now in production, the system consists of two major components; Pacific's

"Reel-Safe," an automatic shoulder harness reel; and an entirely new buckle assembly which features metal-to-metal *plug-in fittings*.

Wearing Pacific's shoulder harness with the "Reel-Safe" allows flight personnel surprising mobility. When the strong, lightweight webbing is adjusted properly, the user has complete freedom to move forward from the waist to perform necessary cockpit duties. Yet in any emergency which tends to throw the occupant from the seat at an acceleration from 2 to 3 Gs in any direction, the "Reel-Safe" locks instantly and securely.

The "Reel-Safe" differs from conventional equipment in that it is *multi-directional*, and is sensitive to acceleration of the crew member with respect to his seat.

The newly-developed "Saf-T-Matic" Buckle assembly is a simplified design which permits the pilot or crew member to attach the shoulder harness and lap belt just by plugging the straps into the buckle. The permanently attached crotch belt merely positions the others, and when not in use, the buckle hangs down in front of the seat where it cannot be damaged or cannot harm adjacent equipment. Because both lap belt and shoulder harness plug into the buckle, there are no long straps to thread or to trail on the deck.

Pacific's unusual release feature,

particularly valuable for fast emergency operation, is even simpler.

Disengaging shoulder harness and lap belt straps simultaneously may be achieved by one operation at a single point since just a quarter-turn of the buckle face in either direction releases all straps instantly. For extra convenience, the shoulder straps proper may be released by pressing forward on a plate at the top of the buckle. In each instance, special details of the design prevent the straps from being disengaged accidentally.

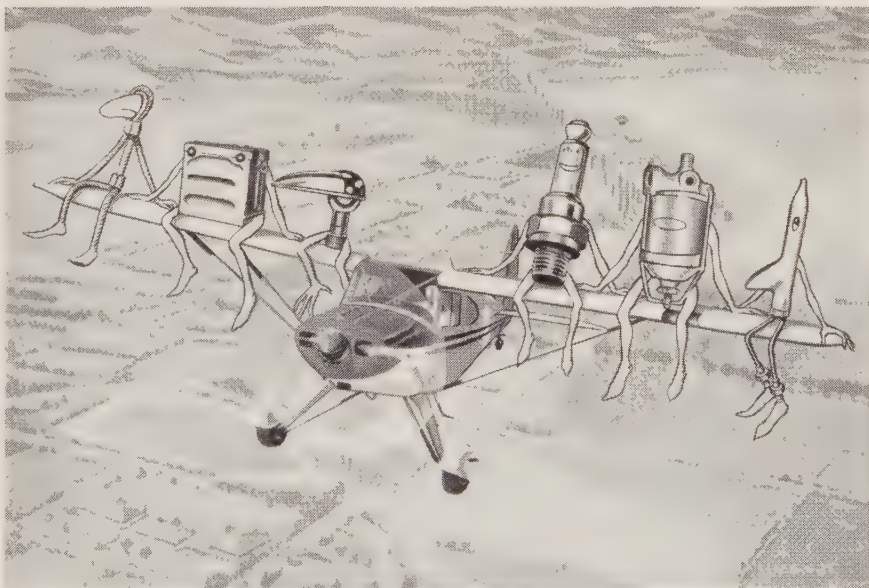


DISPATCHER, new two-way radiophone by Motorola, is shown installed in airport runway sweeper. Use of transistors results in low power drain, compactness and ability to be used with any primary power source, found on various airport vehicles.

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More On Skid Warning Devices

Because this is the season when runway conditions are at their worst, with ice and hard-packed snow added to wet surfaces, SKYWAYS feels that anti-skid and skid warning systems merit close scrutiny.

As with propeller auto-feather systems and anti-collision systems, there is a strong divergence of opinion as to whether such a system should be fully automatic (not under control of pilot once energized) or semi-automatic, meaning instant warning as to a skid condition, the pilot retaining the actual right-of-command decision as to brake application. Obviously the median solution between two such choices is one that will evoke a natural reaction on the pilot's part in a minimum time.

Such a system is the Goodyear Skid Warning System mentioned briefly in November 1957 SKYWAYS. Skid control systems offer four major benefits to individual aircraft or fleet owners:

- Reduce tire wear;
- Prevent blowouts;
- Maintain better ground control;

Insure short stopping distance. Low cost and weight, with small space requirements, are of prime importance.

In modern aircraft, because of size and high landing speeds, it is often difficult for the pilot to know instantly when his wheels are skidding.

With the skid warning system, if a skid starts to develop, the pilot is warned by a sharp and insistent rapping on the sole of his shoe. This signal demands immediate attention and the pilot's natural reaction is to pull his foot back, thus decreasing brake pressure. As soon as the threatened skid is past, the signal ceases and the pilot increases brake pressure. The system permits the pilot to control the brakes as he sees fit, and it keeps him constantly informed of what his braking effort is accomplishing at the wheels.

When a wheel starts in to a skid condition because of overbraking, its rotational speed changes at an extremely high rate (see Figure 1.) The part of the curve marked A illustrates the fast deceleration of a wheel as compared to the normal deceleration path of the airplane. This deviation from the normal is used to trigger the skid warning system into action.

With Skid Warning it is possible for the wheel to decelerate to a locked condition momentarily as shown at the point marked D, in those instances where the pilot may not react fast enough to the signal to reduce brake pressure. However, he can always react fast enough to permit speed recovery before tire flat spotting begins.

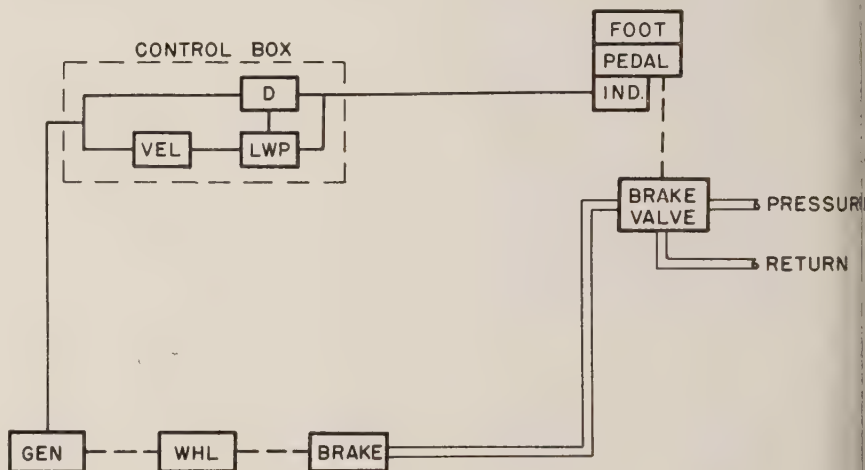
The Goodyear system is of the electrical type. A DC generator is installed in the airplane axle, and driven by the airplane wheel, to sense the changes in wheel rotation. The output of this generator is a voltage that is proportional to the wheel speed. By connecting the generator through specially-designed electrical circuitry, the deviation of the wheel from a normal deceleration can be sensed and used to trigger the skid warning indicator. This sequence is illustrated by the block diagram.

The electrical signal from the gen-

When neither a deceleration nor locked-wheel condition exists, the indicator is at rest allowing the pilot to apply pressure as he desires. A switch is included in the power circuit to permit the pilot to turn off the system should he so desire.

If the wheel decelerates into a locked condition the signal will stop and the pilot may think the wheel is returning to speed; whereas, in reality, it is not turning at all. This makes it desirable to have the locked-wheel prevention circuit shown added to the sensing power circuits.

This circuit requires an extra set of contacts on the power relay and makes use of the velocity sensitive relay which was provided in the sensing circuit. With this addition, whenever a wheel deceleration occurs at a speed greater than 10 to 15 knots, both the velocity and power relays will be pulled in,



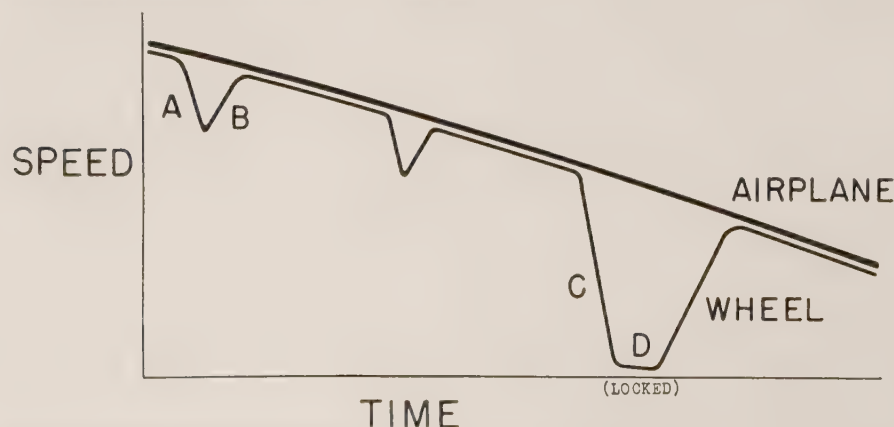
erator is fed into a control box which contains the necessary electrical equipment to sense a particular wheel velocity and also a wheel deceleration. This is indicated by the blocks marked VEL and D. The velocity signal and the decelerate signal together are used in a special circuit marked LWP which is the locked-wheel prevention feature. The signal from either the locked-wheel prevention circuit or the decelerate block is then sent to a skid indicator unit mounted on the brake pedal. The indicator thumps the pilot's foot causing him to release brake pressure.

creating a path for battery power to reach the LWP circuit. This charges the capacitor in the circuit. If the wheel decelerate signal now ceases, the capacitor discharge in the locked-wheel prevention circuit holds its relay closed, thus keeping the skid indicator energized. Note that this can only occur if the velocity sensitive relay drops out, as it does when the wheel is at low speed. If the wheel is not at the low speed necessary to allow this relay to drop out, the locked-wheel prevention relay contact, although closed, will have no effect on the skid indicator.

Also, it should be noted that with this arrangement, if a deceleration is experienced at a low wheel speed, the locked-wheel prevention circuit will not be activated, because the velocity sensitive relay is not in a position to permit this energization. This provides the locked-wheel prevention that is needed at high airplane speeds, but prevents periods of skid indication when the airplane is actually moving at a slow speed, even though skid signals may be present.

To make this warning circuit even more complete, and to give the aircraft operators all of the features that they may desire, a system operation check can be made by adding the circuitry.

The check-out switch provides t



Planes Agog at Spectacular New Terminal



Crews and passengers unload conveniently at front door. Main lobby, VIP office, flight ops room downstairs; Flight Deck Restaurant, coffee shop on second floor.



Luxuriously-furnished main lobby features oak paneling, terrazzo floor, colorful view of ramps and runways. Adjacent flight ops, rent cars, and restaurant.

BIZ AVIATION'S TOP SHOWPLACE WINS APPROVAL

The day Southwest Airmotive opened the doors, its new business and military flying terminal became the scene of unrehearsed drama and happy human emotion.



Beauty and Comfort

A pretty mink-swathed lady who'd flown into many an airport with her pilot-husband dashed about breathlessly inspecting the plush SAC layout. She summed up everyone's reaction when she sank at last into a deep chair in

the lobby and said, simply: "Ahhh-hhhhhhh."

An oldtime executive pilot was overwhelmed by the flight ops room and related etceteras and just frankly couldn't believe it all.



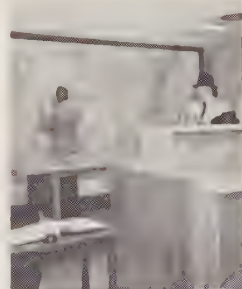
Fine Restaurant

"It's great," he said. "But where's the catch — what'll it cost me to use all this?"

He nearly split his leathery face wide-open grinning when told, "Nothing — nothing at all, podner."

When the manager of the second floor Flight Deck Restaurant first saw the night-time view out his great panoramic window, he sat down almost reverently and said, "Where have I been all my life? What a place to eat!"

The top VP of a firm making new business planes cancelled an appointment, spent an hour taking it all in, then observed:



Flight Operations

"We've arrived — and I don't mean just Southwest Airmotive. All of us in business aviation Have Now Arrived."

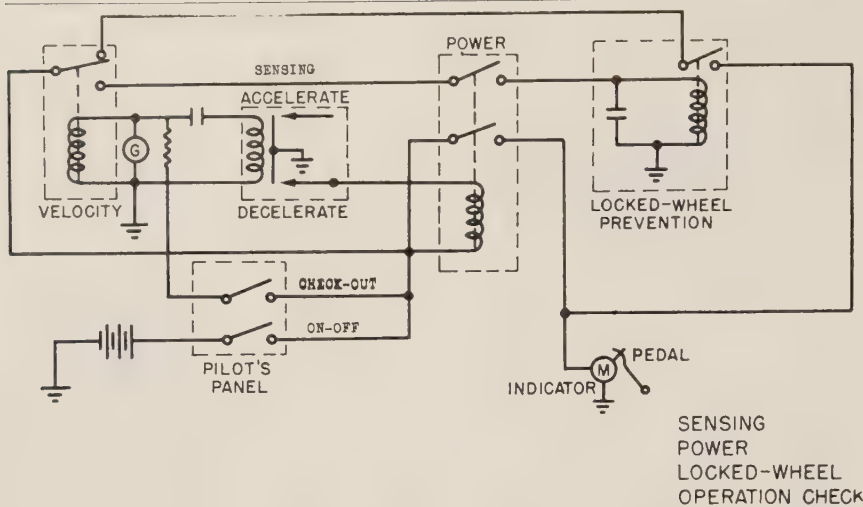
Now, we want to know what YOU will say. Come take a look — we predict you'll say plenty.

Southwest Airmotive Co.

LOVE FIELD, DALLAS

DISTRIBUTION DIVISIONS: KANSAS CITY • DENVER

1932 — A QUARTER CENTURY OF LEADERSHIP — 1958



pilot with a method of applying battery voltage into the control circuit that simulates the voltage output of the generator during a skid signal. When the pilot throws this switch it is equivalent to sending an accelerate signal to the control box. The sensing circuit capacitor is charged, and the velocity relay is pulled in. When the pilot releases the switch, current flow in the sensing circuit is similar to that which would occur with a decelerate signal from the generator. This causes the polarized relay and the power relay to actuate and the skid indicator to run. This simulated decelerate signal stops quickly; however, it has been sufficient to charge the locked-wheel prevention circuit capacitor, and its discharge keeps the skid indicator running for the prescribed time.

The check-out procedure can be made by the pilot during his landing approach, or at any other time he desires to make sure that his skid warning system is in good working order. The switch is located within easy reach of the pilot, usually in a panel with the system "on-off" switch.

The skid indicator unit is a motor driven vibrator attached to the brake pedal. The plunger which strikes the pilot's foot is fastened to a leaf spring. The spring is depressed by an eccentric or cam on the motor shaft and is then released so that it snaps the plunger against the pilot's shoe.

Various other types of warning devices, such as lights and buzzers, have been tried; but tests prove that the tactile signal directed at the pilot's foot is the most effective. This is logical because the pilot's foot is the body member which has to move in order to remove brake pressure, so it is the most natural place to start the warning impression.

The Goodyear Skid Warning System has been proved in the lab and in the field as an effective skid control system where safety, economy, and good stop distances are required at minimum cost.

Average savings in stop distances throughout a number of runs was over 14%; and on one run, the saving amounted to 21%.

The Goodyear Automatic Anti-Skid

system is similar to the Skid Warning just described. In this case, a solenoid valve is operated instead of the warning device, automatically releasing and reapplying brake pressure as required.

In certain kinds of airplanes, especially those with more than four wheels, a combined anti-skid and skid warning system has great possibilities. This is called *Pilot Modulated Anti-Skid*. It not only gives fast, sensitive, automatic control, but it also permits the pilot to know what his wheels are doing, and therefore, to modulate his brake pressure for the smallest number of anti-skid cycles, yet maintaining a pressure close to the optimum for maximum braking all the way through his landing run.

Anti-Collision Light Effectiveness Dramatically Displayed at Quebec

CHES NEWHALL and TOM DOW-BIGGIN of LUND AVIATION caused the Chateau Frontenac management considerable concern during their demonstration of the ATKINS ANTI-COLLISION LIGHT at the AITA Convention in November. When the flashing light was set up and operated on an outside window sill, the hotel was besieged with panic telephone reports of fire, electrical short circuits, etc., etc. Hotel managers, electricians, firemen and detectives descended on Room 5414 in what is described as "record time."

The cause of the "false alarms" is distributed exclusively in Canada by Lund Aviation (Canada) Limited, and is referred to as a "revolutionary" type of Anti-Collision or Relative Danger Light.

Designed specifically to prevent in-flight collisions, the Atkins light is a high intensity flashing white light which, when mounted on an aircraft, provides visual warning in three zones of relative danger, with a different flashing rate in each zone. The device gives a pilot an instantaneous and striking indication of another plane's direction of flight and tells him at a glance whether he is on a collision course so that he has the maximum amount of time to take evasive action. (See SKYWAYS March 1956)

Visibility tests have been made under a number of conditions and has been established that the light has almost unlimited visibility on a clear night. Under daylight conditions in a snowstorm the light can actually be seen twice as far as the normal daylight visibility.

The unit weighs about 5 pounds and measures approximately 6 inches wide, 4½ inches high, and 32 inches long. The light mounts entirely on the surface of the aircraft and does not require any cutting into the fuselage.

Passengers You Should Refuse

Corporation pilots are sometimes called upon to accept as passengers persons over whom they may have even less control than the airlines with regard to physical condition or adaptability to flight. A report of the Flying Physicians Association should be a helpful guide supported by discretion questioning prior to actual loading. We quote:

"... Any patient you would allow to travel by any other means should be able to travel by air, unless he falls into one of the following categories. THESE PEOPLE SHOULD NOT FLY."

1. Pregnant women beyond the eighth month.
 2. Pregnant women who habitually abort.
 3. Infants under fourteen days of age.
 4. Congenital heart disease patients who cannot tolerate one flight up stairs.
 5. Patients with a hemoglobin under 60%, or who have had a recent transfusion.
 6. Diabetics who cannot administer their own insulin, or who are easily subject to reaction or coma.
 7. Patients with any active pulmonary disease or cavitation.
 8. Patients with valvular heart disease who are not fully compensated.
 9. Patients with other than symptom-free Angina Pectoris.
 10. Coronary Thrombosis patients prior to six weeks of onset.
 11. Patients with contagious diseases.
 12. Bulbar poliomyelitis patients.
 13. Patients with wired jaws, large unsupported hernia, intestinal obstruction, draining or open abdominal wounds, wet gangrene, odoriferous colostomies, ulcers that are threatening to perforate, or post-surgical patients prior to 10 days.
 14. Psychotics or potential psychotics should not fly.
 15. Patients who do not have control of bodily functions.
 16. Patients with acute upper respiratory infections.
 17. Patients with sinus and throat infections should not be flown over 2,000 feet.
 18. Patients with heart disease and/or lung disease should not be flown over 5,000 feet without oxygen.
- (SKYWAYS comment: Because this is strictly a medical advisory, passengers

ously under the influence of alcohol not mentioned. Excessive drinking passengers prior to and during flight a problem even greater to corporate crews than airlines!)

Safety Seminar

Comment at the 9th International Seminar on some of the current, critical problems facing aviation has been by the Flight Safety Foundation,

Some of the subjects on the agenda for discussion were the prevention of air-air collision, the reduction of land accidents, the fire problem including hazardous cargo and crash fire suppression, air-sea search and rescue techniques and many others.

P. J. deGroot, West Coast representative of Switzer Bros., Inc., spoke on the use of new, fluorescent paint on aircraft as a safety measure.

In one test," he said, "a T-33 jet trainer, with only the external 'tip tanks' painted 'blaze orange,' was flown around the local area of one of our bases. At a time when the pilot could not visually locate another aircraft in the sky, he made a call on his radio asking anyone who saw his aircraft to give him a call. He immediately received six or eight replies from aircraft on his frequency. These aircraft reported their relative position to him; however, he still could not see them." William Littlewood, vice president of the Flight Safety Foundation, reported research for American Air-

lines, discussed the Aerojet-General Corporation's infra-red proximity warning system used as an interim measure and expressed appreciation to the company for using its own funds for development in the face of the opinion of some experts that this job could not be done.

Dr. A. F. Zeller of the U. S. Air Force emphasized the inability of pilots to react quickly enough in high speed aircraft to avoid a collision and suggested that among other measures to reduce this risk were greater conspicuity and more important, control of traffic.

A new lighting arrangement developed by United Air Lines was demonstrated at sea when the seminar participants were aboard a United States Coast Guard Cutter observing night sea rescue practices. Advantages over existing anti-collision lights were listed as giving direction of motion as well as position of aircraft.

Navy personnel demonstrated how to extinguish a magnesium fire quickly, a hitherto unsolved problem, by using a new chemical, TMB. Also shown was a "sputnik" fire extinguisher designed to be carried by helicopter to attack crash fires that occur beyond the boundaries of airports.

After a spell of freezing rain, one pilot reported: "Braking action was nil, but very good in the snow off the end of the runway. (APPROACH)

Small, Light Airborne Radar Beacon

An Airborne Radar Beacon two-and-one-half inches in diameter and weighing only six pounds has been developed by Stavid Engineering. Originally designed for use on the North American X-15 aircraft, the Beacon receives single-pulse transmissions from tactical radar sets and develops a coded pulse reply for transmission back to the radar. The coded reply will be used by the radar operator to track the aircraft and/or to identify each aircraft where several are in an operation.

What They're Saying

. . . about SPEED CONTROL

"My Speed Control 12 has now operated 300 hours on our 205 Navion and is doing a splendid, reliable job. It was purchased primarily as insurance and has fully justified itself. On two occasions on final approach an emergency made necessary an abrupt change of course—once to avoid another aircraft—and in both cases the Speed Control Indicator prevented a stall. It has proved particularly useful in instrument approaches and for night landings. Always use it for take-offs and landings."

Quentin Berg
BERG MANUFACTURING CORP.
New Cumberland, Pa.

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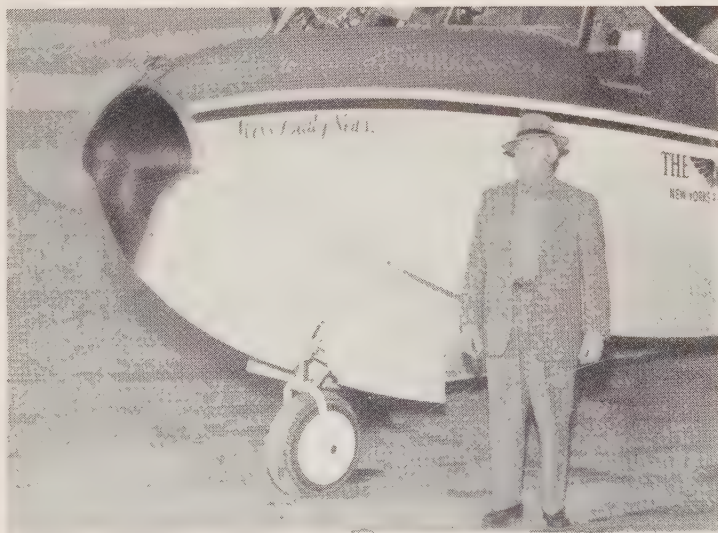
NOW THE COMBINED FACILITIES OF
AERO TRADES & AIRMAR HAVE SUCCESS-
FULLY INSTALLED THE FIRST RCA-AVQ 50
RADAR IN GRUMMAN MALLARD AIRCRAFT

**Radome Installation Retains Exact
Nose Shape and Configuration**

**Scope Located Directly In Front of Pi-
lot in Main Instrument Panel**

**Approved Supplemental Type Cer-
tificate SAI-127 Covers Installation**

Approved Kits Available On Request





Skyways Adds Canadian To Staff

Expanding Skyways' coverage of business flying in North America, the editorial department has added R. J. (Chick) Childerhose of Toronto, Ont., to handle the new section, Canadian Reports.

First prize winner in the Canadian Aviation Writers Awards Contest of 1957, Childerhose worked in 1948 as a cub reporter on the Winnipeg Free Press. In 1952 he was flying Vampire jets. The same year he switched to Sabre II aircraft as a member of the 434th Fighter Squadron. With the squadron he spent two years at Zweibrücken, Germany.

He established the present speed record from Vancouver to Halifax in a five-hour-30-second flight in a Sabre 6 with Flight Lieut. Ralph Annis in August 1956.

Released from the RCAF Regular Force in October 1956, he became assistant editor on Aircraft magazine. He is still an active pilot.

Canadian Pilot-Owners Form Emergency Air Corps

A group of civilian pilots and aircraft owners, recently formed the Ottawa branch of the Emergency Air Corps. Designed to augment RCAF and Civil Defense operations in an emergency, the EAC organization hopes to spread through Canada just as the Civil Air Patrol has in the U.S.A.

As yet the EAC has not received the official blessing of the Canadian government, the RCAF nor the Civil Defense. However, all of these government organizations have expressed keen interest. In particular, the RCAF regards the EAC as a possible integral part of a perfect air search pattern for missing aircraft, hunters, ships or the spotting of disaster areas.

One form of cooperation with Civil Defense authorities would make available pilots and planes for the fast and immediate transfer of key officials from one area to another, as well as for ferrying of vitally-needed medicines and foods into stricken areas.

Official endorsement by Civil Defense can become a reality once red tape blocking such approval is cut. One of the big problems presently facing CD

officials is the responsibility for private aircraft either damaged or completely written-off while flying on an official CD mission.

Bill Peppler, manager of the Canadian Owners and Pilots Association, says, "We have something very definite to offer to air defense and air rescue here in Canada. We have the types of aircraft that can augment the search pattern of the faster airforce planes, and we believe that we could contribute valuable assistance to the RCAF or the Civil Defense in their many exercises."

Calgary Business Plane Service

A modern hangar specially designed for the storage and service of the fast-growing business aircraft fleet is planned for the Calgary Municipal Airport. Field Aviation Co. Ltd., has submitted proposals to the City Council under which they will undertake the immediate construction of the hangar, providing that the City will make the site available.

Field Aviation Co. Ltd., has engaged in the maintenance and overhaul of aircraft at Calgary's airport for the past seven years. The present RCAF-leased hangar will continue to be used for overflow purposes.

Field employs an airfield staff of 15 men at Calgary compared to 250 men employed at the firm's overhaul base at Oshawa, Ont. The company plans to expand the Calgary base to provide comparable facilities.

Field Aviation is one of the companies in the Hunting Group. Other companies in the same group already based at Calgary are: Hunting Technical and Exploration Services Ltd., which provides geological and geophysical services; and the Gibson Crude Oil Purchasing Company. Gibson's main activity is in the marketing of oil and the ownership of pipelines.

Companies owned by the Hunting Group in Canada include The Photographic Survey Corp. Ltd., (engaged in air survey); Aeromagnetic Surveys Ltd., (engaged in airborne geophysics); Kenting Aviation Limited, which operates a large fleet of twin and four-engine aircraft; and Kenting Helicopters Ltd., which owns and operates a fleet of Sikorsky S-55 helicopters on the DEW line.

Proposal To Enhance Business Flying Safety In Canada

According to Squadron Leader R. H. Strouts, officer commanding the RCAF's Rescue Coordination Centre (RCC) for the Eastern Area, most search operations in Canada involve civilian aircraft.

"And since the purely-for-pleasure fliers generally restrict themselves to the local area of their flying clubs, most searches are kicked-off by business-type aircraft on long hops," Strouts said.



JOAN FAIRFAX, beautiful Canadian TV star, is shown taking delivery of her Cessna 172 from Trevor Acfield, sales manager Sanderson Aircraft Ltd., Malton, Ont. Miss Fairfax purchased the 172 as an aid to meeting television engagements. She is now operating a Beechcraft Bonanza.

This fact is partially a reflection of Canada's topography. There are few centres of business that are not separated by vast tracts of wilderness, few air routes that pass over civilization from start to finish. Thus, in most parts of Canada, it is critical that flight plans be filed, and arrival reports made at the other end. This is the best means of alerting the people who must know.

In Canada, the RCAF is charged with the coordination and supervision of all search and rescue activity. Control is carried out from six major coordination centres at Torbay, Newfoundland; Halifax; Trenton, Ontario; Winnipeg; Edmonton and Vancouver. Working from these centres are flying units equipped for the search and rescue role with Dakotas (DC-3), D.H. Otters, Cansos and helicopters. Although these aircraft are allowed to carry out other duties, they are never allowed to undertake jobs which will prevent them from being instantly ready for their primary responsibility.

The list of primary facilities of the RCAF for search and rescue work also includes a group of specially-trained airmen known as the "Para-rescue" squad. Hand-picked volunteers, all of them graduates of the rugged Survival Training School at Edmonton, may be called upon to parachute to aid the victims of a crash. In event that survivors are in need of skilled medical help, there are medical officers, nursing sisters and medical assistants available who have taken the same parachute training. Generally however, the para-rescue personnel themselves can ad-

(Continued on page 44)



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RICHARD W. GROUX, *Assistant to Executive Director NBAA*

Compiled and edited from leading air safety publications issued by military, naval, airline, government agencies and from private and business pilots' experiences.



'Testing 1-2-3-4-5—5-4-3-2-1 . . .'

Aero-Otitis may sound like an Irish flying club to some folks, but every aviator, Irish or not, should be aware of the potential danger of this innocent-sounding condition.

For those who haven't yet served their internship, aerotitis is a non-infectious inflammation of the middle ear caused by differential pressures within and outside the ear. Sometimes it's called barotitis—same thing. It's a year-round problem to aviators. Many flying hours are lost because of ear troubles, and of those hours many are lost through misconception and lack of knowledge on the part of the grounded pilot who "just can't seem to unblock this ear."

YOU CAN do some things to avoid ear infection and injury; if you understand the seriousness of this malady seek treatment instead of passing it off with a "it's never hurt me before."

For purposes of practicality, the middle ear may be considered as a rigid, box-like structure whose purpose is enclosing the chain of three small bones, so essential in transmitting sound from the vibrating drum to the nerve receptors of the inner ear. This box is connected to the outside through the Eustachian tube which opens, on either side, in the back part of the nose.

It is this tube which must remain open and allow the pressure in the middle ear to equalize with that of the surrounding atmosphere. Because of a flutter valve as its opening, and because the walls are not rigid at its lower end, expanding air can escape very easily so that normally no difficulty arises during ascent.

On descent, where air must be readmitted in the face of increasing pressure, we find the flutter valve working against us. Also the canal itself may be collapsed by slight pressure. This is the normal everyday problem in one who is unencumbered with any respiratory infection. It can now be understood why, when one has a cold and his entire nose is stuffed up, difficulty is encountered with ear blocks. However, it must be pointed out that in such a condition air may not even be able to leave the ear, and aero-otitis can result during ascent, although rarely.

With pressure differences acting on the lining of the middle ear box, the blood vessels become expanded and cause pronounced redness of the drum. As the natural history of the disease progresses, this dilation may lead to seepage of fluid and even hemorrhage into the middle ear cavity. Infection may set in because bacteria love this

type of nourishment and a long drawn out otitis resulting in deafness may occur.

Deafness may also result even with no infection, because in a certain percentage of cases the fluid is not reabsorbed and may solidify around the small bones, preventing them from vibrating. Another complication of these pressures is perforation of the drum which may lead to hearing impairment and also infection.

The common cold is perhaps the greatest factor in the production of this disease. Once a block with fluid *HAS* occurred, an estimated two to three weeks of flying are lost. On the other hand, grounding for a cold rarely exceeds five days. In essence, it merely boils down to a problem in practicality and logic—five days versus three weeks.

The fact that an individual with a common cold may be able to clear his ears while sitting in the readyroom has no positive assurance that this situation will prevail at 10,000 feet. A much more valuable prediction can be made after examination by your flight surgeon. This is part of his job.

Lastly, there are many medications involved in the treatment of these conditions which have side effects that necessitate grounding in themselves. Notable among these are the Mycins and the Antihistamines. Even Neosynephrine and, yes, even your trusted Benzadrex inhaler have been known to cause adverse effects when improperly used. So, think twice before you "aviate," and you may do so a lot longer.

Remember that your *passengers* may not read this article so it behooves you to advise them of this serious problem. (APPROACH)

White Spots

CO₂ fire extinguishers on the parking apron are a hazard to ground personnel during night operations, particularly when directing taxiing aircraft. It is recommended that a white spot, approximately four feet in diameter, be painted on the area where the extinguishers are normally placed when not in use. (APPROACH)

Bird Nests in Engines

One instance was reported of starlings building bird nests in both engine air scoops of a DC-3 parked on the ferry line less than 36 hours. This is getting to be a flight safety item, and pilots have been requested to thoroughly check each aircraft for the presence of bird nests. (APPROACH)

Runaway Propellers

By: Capt. T. J. Slaybaugh
Office of Safety, Hq. MATS
YOU SHOULD KNOW:

- If a propeller runs away and cannot be feathered, you may not be able to maintain level flight at any altitude even with maximum power on the other three engines.
- That drag of this propeller increases approximately as the square of the velocity, and flight must be just above stall speed. The slower you can fly, the better.
- That if the engine is frozen and the propeller uncouples, the drag will be reduced considerably. However, if the engine is frozen and the propeller does not uncouple, drag will probably be increased.
- If the propeller is an outboard you will probably need full rudder and aileron trim, full, or nearly full, rudder deflection and full, or nearly full, aileron deflection to maintain heading. It is possible that power may even have to be reduced on the opposite side in order to keep the aircraft from turning into the bad engine.
- Anything you can do to get the prop into higher pitch will help tremendously, but chances are you can do nothing.

* * *

Information from the propeller and airframe manufacturers and data derived from tests and calculations of the Stratocruiser that ditched in the Pacific last October depict the effects of an uncontrollable prop for this particular circumstance. Drag resulting from this propeller with the blades at the low pitch stops, 21.3 degrees, 145 knots, 2,000 feet MSL, would be:

Uncoupled windmilling . . . 520 lbs.
Coupled windmilling . . . 1,880 lbs.
Frozen . . . 2,320 lbs.

The additional power necessary to compensate for the additional drag each of the above conditions is:

520 lbs. 295 BH
1,880 lbs. 1,060 BH
2,320 lbs. 1,380 BH

Since there is no way in which the tremendous drag and control forces can be simulated in either a simulator or an aircraft, the only emergency training that can be given in advance is to make aircrews aware of this problem in order to cut down panic and to provide them with the best possible information as to corrective action.

What should the man in the left seat do when a propeller suddenly runs away?

Here is what Hamilton Standard recommends:

"Pull everything back except the

feathering button—throttle, RPM, yoke; feather on the bad engine—the works.” defines a windmilling, uncontrolled prop as one that has gone to the high pitch blade angle.

As a general rule, the company states that the drag of a frozen propeller is greater than that of a windmilling propeller and freezing is not recommended. From the specialists at WADC we learn that if the low angle stop is not effective (this is most likely on props not equipped with mechanical low angle stops), the blade angle will continue to go down until centrifugal twist, friction and aerodynamic moments are balanced.

In such a case, control of the airspeed may not be possible and freezing should be considered. As the RPM decreases due to freezing action and beyond the governing range, try feathering.

It should be noted also that in the case of stopping the propeller through feathering, a peak propeller drag is reached which is greater than either normal windmilling or fully feathered value.

Data indicate that below a blade angle of about 15 degrees the locked propeller will have less drag than the windmilling, whereas above that value the windmilling propeller will have less drag. The cross over point is a function of propeller geometry and amount of feathering and pumping torque required to turn the engine. The most favorable feather for the windmilling propeller occurs when the engine becomes uncoupled from the propeller because the propeller does not have to pick up rotational energy from the airstream at the expense of drag to overcome the feathering and pumping of the engine. The only energy required from the airstream, in the uncoupled case, is that required to overcome the aerodynamic resistance of the propeller itself.

As a general rule, WADC tells us, propellers equipped with mechanical low pitch stops can be expected to produce less drag (negative thrust) when windmilling than when frozen, while propellers not equipped with mechanical low pitch stops can be expected to produce less drag when frozen. This is because the mechanical low pitch stop usually allows the crossover blade angle.

Safety, engineering and operations personnel are giving a hard look at present emergency procedures for handling runaways when the propeller will not feather.

Currently, here are some considerations:

1. Slow the aircraft down to just above stall speed.

2. Fly at a low altitude where the density of the air is greater and the true airspeed can thereby be decreased.

3. Don't freeze the engine if the runaway propeller is the only consideration.

Drag in most cases will be greater when the engine is frozen and the propeller is stopped than with the propeller windmilling. This applies in all cases to propellers with low pitch mechanical

stops when the blade angle is at the limit or above. Of course, if other malfunctions exist, such as severe vibration or loss of oil, controlled freezing may be dictated. If so, freeze at the slowest possible airspeed and, if altitude and all other factors permit, consider feathering the adjacent propeller until freezing has been accomplished. (One engineer told us that if six inches are lost off one blade of an adjacent engine's propeller, that engine will vibrate itself completely off the wing before it can be shut down.)

- Don't attempt intermittent freezing, but close the firewall shut-off valve and leave it closed. Freezing will be accomplished in the minimum amount of time, and there will not be the tendency for bearings to be washed away a little at a time as could be the case were intermittent freezing attempted. Other suggestions as to freezing are to move all personnel out of the prop line, depressurize, and as RPM's decrease, keep trying to feather. The feathering motor may be able to overcome centrifugal turning moment working on the blade as the RPM decreases. It has been done just this way several times.

- Consider dumping fuel and/or jettisoning cargo.

- Remember the advantages of ground effect, as a last resort.

- Completely uncontrollable, high speed runways are not everyday occurrences. Few pilots have experienced such major emergencies. They should not be misconstrued with prop overspeeds in which the procedure is:

- Reduce throttle

- Try decreasing RPM manually

- If ineffective, try reducing RPM with intermittent feathering and if it doesn't hold, feather

- If the prop will not feather, reduce airspeed by retarding all throttles, and pulling the nose up.

The rules set out in this article represent the general procedures for coping with the uncontrollable, runaway propeller. It should be remembered however, that each emergency of this kind is an individual emergency that may require deviation from these generally recommended procedures. The decision as to the best way to handle each individual emergency must, therefore, lie with the crew involved. It is felt that knowledge of runaway characteristics and aerodynamic considerations as presented in this article will better enable the crew to analyze and handle the emergency. (THE MATS FLYER)

New Dri-Powder Type Extinguisher

Safety First Products Corp. of Elmsford, N. Y., has developed a new three-pound capacity dry powder fire extinguisher with Underwriters Laboratories listing and an extinguishing efficiency rating equal to eight one-quart vaporizing liquid (carbon tetrachloride) extinguishers.

The small extinguisher measuring only 17½ inches high by 4¾ inches in diameter and weighing 8 lbs. fully charged, is pressurized with 130 p.s.i.



nitrogen and charged with especially treated bicarbonate of soda, free-flowing, non-caking, non-toxic and non-abrasive. It can be re-charged at any of the company's 1,800 service units across the country or at any other qualified extinguisher service point.

Called the "Dri-Powder" extinguisher, it can be used on fires where water cannot be used such as electrical and flammable liquid fires as the UL rating of 4 B:C indicates. Propane, butane and other gas fires can be extinguished with this unit. Fires in ordinary combustibles such as cotton lint, fabrics and weeds which are not deep-seated can be extinguished in seconds. Dry powder is the only extinguishing medium which can be used safely on a human being whose clothing is on fire.

Civil Service Commission Action Sabotages Weatherman Services

Announcement by the U.S. Civil Service Commission last December 9 establishing minimum pay rates for Professional Engineers and Certain Scientists has brought a negative reaction from the American Meteorological Society because of the omission of Meteorologists in the series of positions listed.

A telegram signed by Robert D. Fletcher, president, AMS, was sent to the Civil Service Commission and other government agencies.

Text of the telegram reads, "The American Meteorological Society deplores the exclusion of meteorologists from the salary adjustment recently announced for scientists and engineering personnel in civil service. The Society feels that the long-term objectives of attracting promising young men and women to the meteorological profession and to important work in civil and defense science will best be achieved by eliminating salary differentials that impose financial penalty on scientists and professional people selecting meteorology as their primary field of interest. The nature and the importance of the scientific problems in meteorology and the urgency of further advances in this field are sufficiently well known in our opinion to merit a re-examination of this salary policy. We respectfully request reconsideration of the directive excluding meteorologists from this salary adjustment program."

in the business hangar

■ **GARRETT CORP.'S AIRESEARCH AVIATION SERVICES DIV.**, Los Angeles International Airport, Calif., exchanged all control surfaces on a DC-3 sent in by Sears, Roebuck's Atlanta Div. This included installation of geared rudder and aileron boost. Pilot is Bill Dameron.

Thompson Products' DC-3, flown by Bob Sheriff, had radio repair work and sliding panels replaced in cockpit windows.

Pacific Power and Light's DC-3 was flown in for two panoramic windows, enlargement of other cabin windows and a one-piece windshield.

Ingersoll Milling Machine Co.'s DC-3 was in for an 1830-94 Maximizer installation, Janitrol heater and interior refurbishing. Chief pilot is Frank Lindgren.

Morrison-Knudsen's D-18 had heater overhaul and 100-hour inspection. Bill Lusby is pilot.

T. O. Flyers' Aero Commander, flown by T. T. Oxnard, had new G. E. electronic compass installed.

Goodyear's D-18 was in for 100-hour inspection. Pilot is Earl Hartman.

Axelson's DC-3 was in for routine maintenance. Pilot is Angelo Pappas.

La Brea Securities' Lodestar was given 100-hour inspection and miscellaneous work. Tom Penfield is chief pilot.

■ **READING AVIATION SERVICE, INC.**, Municipal Airport, Reading, Pa., had dual ARG 21 ADF, Collins integrated flight system, Sperry C4A gyrosyn system and complete radio and electrical plastic edge-lighted control panels installed on Carrier Corp.'s DC-3. Pilot is Capt. Floyd Graham.

Patterson, Emerson Comstock's Lockheed was in for a 100-hour check.

Philadelphia Evening Bulletin's Lodestar was in for a complete radio installation, glideslope receiver and plastic edge-lighted radio control panel.

■ **PLANESERVICE**, Van Nuys Airport, Calif., completed radio package installation on super-charged Twin Bonanza for Fred Salyer of Salyer Land Co.

Jack Holland brought in his Apache for 100-hour inspection.

Williams Construction Co.'s H-35 Bonanza was equipped with ADF-12 and Narco Sapphire with dual leads.

Vance Breese had double engine change on his D-18.

McDonnell Aircraft's Bonanza had a 1,000-hour inspection and engine change. Pilot is T. Harris.

■ **AERO TRADES, INC.**, Ronkonkoma, N.Y., re-upholstered and painted General Foods Corp.'s Grumman Mallard also giving it a 1600-hour overhaul. Chief pilot is John Sinclair.

Swiftite Aircraft Corp.'s DC-3 received miscellaneous exterior painting. Jim Rogers is chief pilot.

Long Island Airways' Cessna had structural changes made to incorporate large photographic equipment.

Vincent Astor's Grumman Mallard had a complete repair of integral fuel tanks. Chief pilot is Harold Swift.

■ **SOUTHWEST AIRMOTIVE CO.**, Love Field, Dallas, Tex., completed an engine change on Pritchard Oil Co.'s Super Beech. Pilots are E. E. Scott and Bill Dressel.

Bureau of Reclamation, Department of Interior, had an engine change and 1,000-hour inspection on its D-18S. Bill Snyder and John Sheining are the pilots.

International Paper Co.'s Beech was given a 100-hour inspection and engine change. Pilots are Carl Lund and George Holland.

Permian Mud Service's D-18S was given a 1,000-hour inspection, prop and accessory overhaul and had exchange engines installed. Pilot is Bill Jessup.

Helm's Express had a double engine change and periodic inspection on their Super Twin Beech flown in by Paul Dietz.

Atlantic Oil and Refining's D-18S, flown in by Brian Moses, had a 1,000-hour inspection, double engine change and repairs.

Cummins Engine Co.'s DC-3, flown in by Bill Pruner and Phil Kaufeld, was given a 100-hour inspection and single engine change.

Robbins Floor Co.'s Memphis-based Lockheed Lodestar received major modifications. B. A. Shields and Chuck Hayden are the pilots.

Waterman Steamship's Chief Pilot, Bill Correll, flew their Lodestar in for an engine change.

Rodman Supply's D18S Beechcraft was flown in by James Creel for a 100-hour inspection.

Lockheed Aircraft Corp.'s Lodestar was flown in for miscellaneous work. On board were Lloyd Harris, operations chief; Les Hewitt, pilot; and W. D. McClain, mechanic.

■ **SOUTHERN CALIFORNIA AIRCRAFT CORP.**, Ontario International Airport, Ontario, Calif., is remodeling interior of Twin Beechcraft owned by cowboy star Gene Autry.

■ **REMMERT-WERNER, INC.**, Lambert Field, St. Louis, Mo., completed a double engine change of Trailmobile's Lodestar Super-92 engines. Pilot is Carl Siemer.

North American Life and Casualty's DC-3 was converted to Super-92 engines. Chuck Wilson is pilot.

Mississippi River Fuel's Lodestar had an engine change of its Super-92. Pilots are Ralph Primo and Ray Waldt.

■ **PIEDMONT AVIATION, INC.**, Smith Reynolds Airport, Winston-Salem, N.C., gave 100-hour inspection to D18S of Pochontas Fuel Co. Pilot is Bob Amundsen.

Rish Equipment Co. flew their Apache in for a 100-hour inspection and miscellaneous repairs. Ray Epperly is pilot.

R. J. Reynolds Tobacco Co. had 100-hour inspection performed on their E18S flown by Grant Jeffries.

Olin Mathieson Chemical Co. flew their E18S in for 100-hour inspection. Pilot is M. J. Davern.

Pilot Freight Carrier's D18S had a 100-hour inspection and miscellaneous repairs. Pilot is Buck Teague.



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Miami, Florida

IN SOUTHWEST —

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Love Field
Dallas, Texas

IN MIDWEST —

Minnesota Airmotive Inc.
Wold Chamberlain Field
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The DC-3 "Replacement"

or "CAN THE SPECIALIST REPLACE THE GENERAL PRACTITIONER?"

By C. S. Weaks

To sum it up briefly—there won't be one, says the author.

It seems reasonable to assume that if the aviation industry today can build airplanes to fly three times the speed of sound, fly 25 miles above the earth, carry a half-million pounds of cargo, or rise vertically, it should be able to design something that would offer some overall improvement on one that came out 20 years ago.

This theory is generally accepted, but is perhaps not as reasonable as it appears at first glance. Technical specifications are nice to look at on paper, but there are more important practical considerations that look different at second glance. What is the replacement to replace, and at what cost? Is it necessary, or are its improvements sufficient to justify the trouble and cost.

What other specifications are sacrificed for the improvements? Every few weeks some new design is hailed with growing desperation in the public and trade presses as "The Replacement." This is presumably meant to be high praise. A few have seen action for specific uses, in accord with their best particular feature, but none has lived up to the all-around, do-all, utility performance of the Dowager Duck, the most remarkable piece of machinery ever built.

Most of the major aircraft manufacturers around the world have taken a fling at The Replacement, and Congress has passed a bill giving them financial assistance to encourage them. This may ease some of the shock of its costs, but it will take more than an Act of Congress to come up with something that will replace the wide range of service and performance of the DC-3 at any price.

Even Douglas, the original designer and builder, can't do it. In 1951, Douglas engineers fell prey to conventional thinking and decided their 15-year-old 1936 model belonged to the ages and should be redesigned in accord with "modern" needs. The DC-3 would be its own replacement in the form of a bigger DC-3. They added room in the cabin for more passengers, added horsepower, added some cruising speed, added some other features. When they added up the results, they found they had also added about a hundred thousand dollars to the price, added high maintenance costs and fuel consumption, and added so much to the takeoff run that a lot of small airports could no longer be used. Douglas bowed to fate and went back into full production of DC-3 spare parts.

One of the biggest difficulties for The Replacement is the sad fact that twice as fast doesn't mean half the time. Side by side in the air, the 200 mph DC-3 will naturally lag somewhat behind a converted bomber or big airliner with

its 250, but this doesn't pay off as well as it looks. The market that has to pay for The Replacement can't afford indicated Air Speeds, True Air Speeds, or even Ground Speeds, but is considerably more interested in actual elapsed time between chocks, in the case of airlines, or in actual elapsed time between offices, in the case of executives.

Theoretical air speed margins of fifty or even 100 mph disappear quickly among problems of range, air traffic, ground traffic, ground handling, small airport availability, and other factors. No airplane is faster than the one ahead of it on an Air Traffic Controlled Flight Plan, and 200 miles per hour is just as good as 400 in a holding pattern. Speed can be applied only for a limited portion of a flight, and except for long trips, is of secondary importance in a practical overall operation, but to read some of the Replacement rushes, you'd think nothing else mattered. It doesn't do much good to save a half-hour of flight time if it means an extra half hour taxi ride to a bigger airport, or an extra landing enroute for refueling.

Speed costs money, too. A 100 or 200 percent increase in costs will not be paid for by a 15 to 50 percent increase in airspeed, and price tags of a half to three-quarters of a million dollars are not justified by cruising speeds of 230 to 275 mph. No new production aircraft with an honest cruising speed of less than 340 or 350 can be seriously considered sufficient improvement over existing equipment to justify the extra present-day acquisition and operational costs.

Take the business executive, for example. The length of his average business trip is 596 miles, which looks at first glance like three hours in his company's 200 miles per hour DC-3, and only two-and-a-quarter hours in a Replacement that advertises 275. Office to office, however, after making due allowances for taxiing, warmup, air and ground traffic, clearances, etc., that pleasing three-quarter hour advantage is quite a bit less impressive when viewed as a saving on the whole trip. When you get right down to it, the average business trip is going to take about half a day, whether you go 200 or 300.

One large midwestern corporation that kept its DC-3 busy doing 114,000 miles per year decided to buy a larger, faster, more modern airliner, but prudently did a lot of close figuring first. Projecting their previous complete year's DC-3 operation, and even using sales figures supplied by the manufacturer, they found that such a 600 mile trip in the new plane would save 40 to 50 minutes at an extra cost of \$486; and a trip of 900 miles, their most frequent, would save 60 to 80 minutes

at an extra cost of \$745. On their entire year's operation, cost per mile would double, cost per hour would almost triple, and their savings in flight time would cost \$517 per saved hour extra. Besides that, one of their usual airports would have to be by-passed. So they're still flying their DC-3, and The Replacement has lost another prospect.

The feeder airlines, the other large segment of aviation interested in The Replacement, are rather disenchanted with the offerings to date, particularly since speed doesn't pay off on their short hops of an average 85 to 100 miles. They need more seats and faster schedules to keep costs and fares down to fill up the seats, but it hasn't worked that way, yet. C. A. Myhre, president of Frontier Airlines, said that "operating results of the three carriers (that have tried newer airplanes) demonstrate that the shortness of haul made necessary by certificate restrictions . . . results in significantly higher direct expense per ton-mile in two cases and virtually no improvement in the third case. Furthermore, the depreciation expense per ton mile on the new equipment is so much higher than the comparable expense for the DC-3 equipment that its operating efficiency is more than offset. The problem has been, and is today, that no economies will result from operating a modern airplane on flights which are too short for even a DC-3."

One southwestern airline fervently agrees. It built up a nice business operating about a dozen DC-3s, then decided to switch to modern faster equipment, rated at 250 miles per hour. After a few months, it found that, because of ground time, the new and "faster" airplane couldn't keep up with the old schedule of the DC-3s, and because of the higher maintenance and operating costs, it couldn't pay its own way. When the CAB refused to subsidize it or increase the rates, the airline put the shiny new toys up for sale, and, saddled but wiser, bought some more DC-3s.

Another much touted Replacement feature is pressurization. Pressurization's chief advantage, other than high altitude speed gains which are largely offset by climb and trip length, was supposed to be the ability to fly above storm areas, but there are a lot of big storms and systems that go to 40,000 feet or more and not even the best designs on anybody's drawing boards will top them. A radar-equipped DC-3 can pick its way "comfortably" through any storm area without the necessity of climbing to pressurization altitudes.

The Replacement has to beat strong DC-3 competition on operating costs. A sales brochure from a recent hopeful Replacement sympathizer with the owners of the "outmoded DC-3", stating "Their DC-3 operating costs are rising steadily, and they also must wrestle with the nettlesome problem of partial replacement." A survey of some of the operators and their purchasing agents, however, doesn't quite bear this out.

Both Douglas Aircraft and Canadian are in full current production of DC-3 and C-47 parts, many parts are still available on the surplus markets at

small manufacturers are turning out, also. Many components can be made up in any CAA-certificated re-station.

About 150 airlines around the world still using DC-3s, not including scores of smaller non-scheduled charter, and cargo operators, and more than half of all the world's airlines are still DC-3s. (Funny thing is, the DC-3 was never really certificated or legal for airline use at all. The design of the doors and escape hatches, and a few other details, didn't satisfy the Civil Aeronautics Board, so they gave it a temporary waiver pending operating until something better came along. Nothing ever did. After the second World War, the CAB set, postponed, four different deadlines and which DC-3s would no longer be used in airline use. On June 5, 1953, the CAB decided that the DC-3 could—and presently would—fly forever, and gave it completely, announcing that as far as the CAB was concerned, it would be permitted to continue in scheduled passenger service indefinitely.)

Aircraft service, maintenance and repair stations have a "visibility" condition of new business opportunity if they give all-out service to the corporate or private plane owner. Raul C. Rodriguez, president of Planeservice, Inc., of Van Nuys Municipal Airport in the San Fernando Valley of southern California.

The average local businessman in commercial lines can count his sales potential from within a radius of a few miles. Aviation, a progressive CAA Approved Station has a sales potential that can be measured in hundreds of, or even a thousand, miles," Rodriguez says.

Proof of the latter is that Planeservice has repeat customers from as far away as Massachusetts, New York, Pennsylvania, Canada and Mexico.

Because business aircraft today fly long distances, many coast-to-coast, are potential regular customers, Rodriguez points out.

Since a first impression often is the long one, Planeservice considers its friendly and oil attendants among its most important employees. Pleasant efficient service is a "must."

Checking up the "gas boys" is a trained mechanic who is available to perform minor repair jobs promptly to transit customers.

Cleanliness is another important first impression, and at Planeservice this is not a fetish, says Rodriguez. Hangars, tools and equipment are kept in "shipshape" condition by a full-time janitor. Each mechanic is issued nine pairs of overalls which he changes at a rate of one pair each week. Covers are placed over all seats of aircraft being worked on as well as protective coverings for the carpets. This results in customers remarking "you could eat off the hangar floor," adds the Planeservice chief.

Prompt, on-schedule service is another bid for repeat customers, adds

It is impossible to wear out a DC-3, and it isn't even very easy to wreck one. Tales are legion about the abuse and punishment they have taken. Recently, a Frontier Airlines DC-3 got caught in a vicious thunderstorm, slammed into a mountain, and bounced off again with twelve feet knocked off of its wing, but brought its twenty three passengers in safely to the next airport. A Capital Airlines DC-3 once came in with a load of passengers after a mid air collision tore five feet from one wing.

All this is something like saying that the horse should never have been replaced by the automobile. Well, many recent surveys in New York, Chicago, and other metropolitan areas indicated that the horse used to get from point to point in city traffic more quickly than the auto does today, and the situation is about the same with the DC-3 in our present shrunken world and crowded airways. The DC-3 may not be perfect, but it looks like the hard cold economic facts of life will keep it holding up for a long time against any challenge of a Replacement.



All-Weather Eye For The Mallard

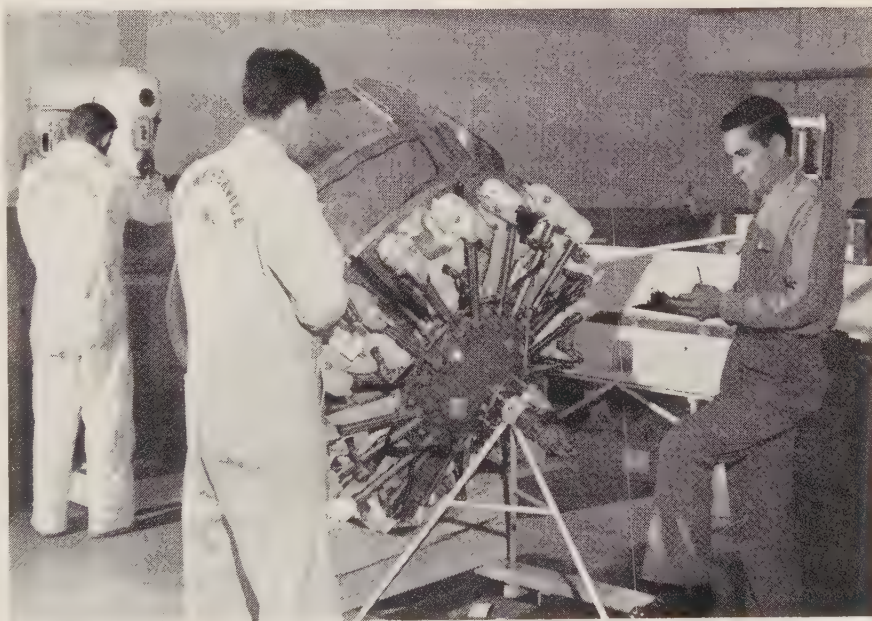
Airmar and Aero Trades of MacArthur Airport, Ronkonkoma, L.I., N.Y., working with McMillan Industries, have developed a Radome installation which retains the original nose shape and configuration of Grumman's Mallard.

This development was achieved in less than eight months, and the actual installation can be completed within three weeks.

Because the Grumman plane is amphibious the Radome had to be stressed for air and water loads to make the installation water tight. This required that the antenna be easily removable from the inside of the plane for maintenance purposes.

Use of RCA AVQ 50 light weight radar made the installation possible. The scope is located directly in front of the pilot in the main instrument panel. The New York Daily News Mallard, piloted by William (Buster) Warner, received the first installation.

PLANESERVICE INC.



PLANESERVICE INC., President, Raul C. Rodriguez, right, checks "power egg" build-up.

Rodriguez. Since most business planes are operated on tight schedules, out-of-service time must be kept to the minimum.

A pilots' lounge that is both comfortable and functional, offers the company pilot a pleasant spot to check weather and file a flight plan.

The large hangar has doors at each end which facilitates moving planes in and out of the structure.

Planeservice, Inc., is holder of CAA Approved License 4095 and may overhaul, modify or repair planes up to 12,500 pounds. It has complete facilities for airframe, engine and radio service. They specialize in twin-engine 1,000-hour overhaul and custom radio

installations.

A staff of 14 mechanics and three radio technicians is maintained. To assure experienced men, Planeservice requires that every mechanic holds an A and E license and must have a minimum of ten years experience. More than half the mechanics are pilots with a combined flying time of more than 25,000 hours.

All work is inspected by a staff of four inspectors. They function in a supervisory and inspection status only. The group, headed by Rodriguez, is composed of William C. Shute, Albert H. Jensen and Joe Cottle. Together they have an average of 20 years experience.



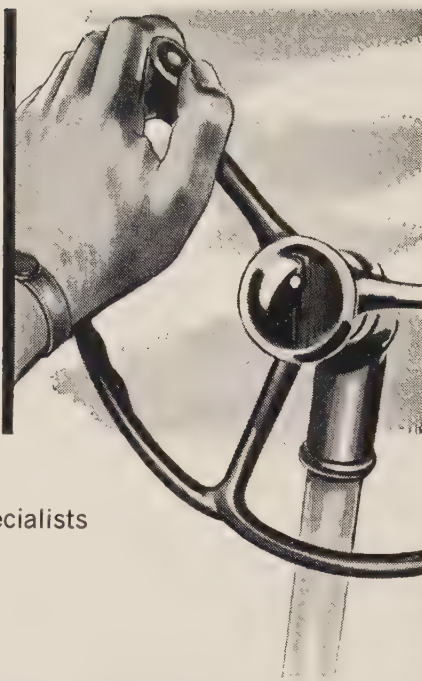
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80% of all corporate aircraft
owners rely on PEA, specialists
in supplying skilled pilots.



PILOTS EMPLOYMENT ASSOCIATES

Teterboro Airport 1, New Jersey, ATLAS 8-9474



ing device flying at 200 mph, is capable of searching an area of 10,000 square miles every hour.

The RCAF offers two suggestions which it hopes will be adopted by civilian companies using SARAH: 1) When an aircraft is forced to land in the southern areas of Canada, the beacon should be activated continuously commencing one-and-one-half hours after the crew becomes overdue at destination; and 2) While in sparsely settled areas, the beacon should be activated for four hours at a time every day, between 9 a.m. and 1 p.m., local time, commencing on the day following the emergency.

An advantage to business aircraft operators flying in Canada is the Ground Observer Corps, which has often been instrumental in the early reporting of an aircraft in trouble. Often they have a call into the RCC before the aircraft's ETA at destination is up, and the normal ATIS overdue reports to the RCC has been initiated. Observer Corps personnel are often asked to check out various leads on overdue aircraft. Often, they are the first on the scene of a crash and are able to report to the RCC full details. A series of sightings reports received from the Ground Observer Corps has often made it possible to track an overdue aircraft into a confined area where it has been found readily.

An example of this occurred in March 1956, when the Reverend Spillnor, flying his Cessna 180, was overdue on a flight from Moosonee to Timmins. Between the two points lies some of Ontario's heaviest bush. The Ground Observer Corps was alerted. The next morning two reports came into the RCC via North Bay, indicating that the aircraft had been seen. The Reverend was located that same day.

During actual search operations, the RCAF is often deluged with offers of assistance from civil aircraft operators. Generally, these offers are turned down, but if they can be used, the Searchmaster can authorize their fuel and other use. In case of necessity, he can arrange to use civil aircraft on a charter basis. However, these are rare instances.

As a man who is intimately concerned with the lives of those pilots unlucky enough to be down in Canadian wilderness, S/L Strouts has strong feelings. These feelings he expresses in a few simple rules:

1. File a flight plan and follow it. When you arrive, file your arrival report.
2. Carry proper equipment: first aid supplies, food rations, and extra clothing. In particular, carry a SARAH transmitter.
3. Know the survival rules such as three smokes by day, three fires by night. People forget that we do night searches too.
4. Stick with your plane, for several days at least.
5. Attract attention! Keep the snow brushed off the wings; use reflective devices. Do anything, as long as it attracts attention to yourself.

Canadian Reports

(Continued from page 36)

minister adequate first aid.

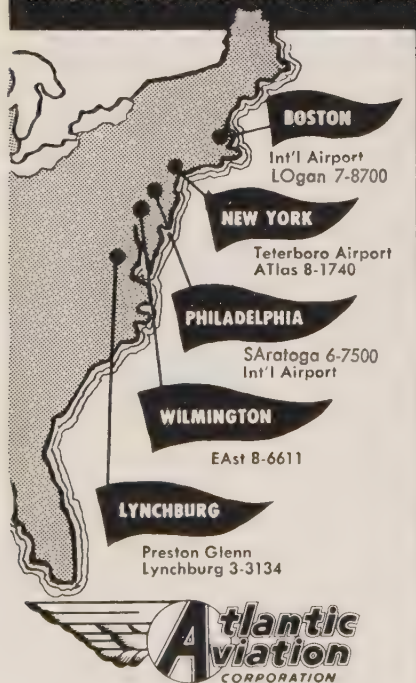
The first search and rescue aircraft dispatched always carries at least one member of the para-rescue squad. In last year's Maritime Central Airway's disaster in Quebec, an RCAF para-rescue team was on the scene barely an hour-and-a-half after the crash. On another occasion, a team jumped in ten degree-below-zero weather to aid three survivors of a Canso crash in the northern Ontario bushland.

But all this can only happen after the wreck has been located. Pinpointing the scene of the accident is by far the hardest part of the S & R role. In the past year, the RCAF has equipped its S & R aircraft with SARAH (Search and Rescue and Homing) receivers. SARAH consists of two major pieces of electronic equipment: a tiny transmitter or "beacon" carried by the survivor, and the radio receiver and homing device carried by the S & R aircraft. The transmitter weighs about three and one-half pounds, while the receiver portion weighs 12 pounds.

Said Strouts, "This SARAH equipment is now a big thing with us. If all business aircraft operating in Canada carried the transmitter package as standard survival equipment, it would save us millions."

He explained that visual type searches are often delayed for several days at a time due to poor weather and visibility. Since SARAH operates equally well in cloudy or clear weather, these conditions pose fewer problems. More important, a larger area of search can be covered in a comparable time. For example, a single aircraft equipped with a SARAH radio receiver and hom-

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thirty years of growth . . . modern equipment . . . hundreds of trained technicians . . . expert leadership . . . and a persistent demand for the best . . . that's why hundreds of business aircraft — Cubs and Bonanzas to DC-3's and Convairs — return to Atlantic for the next jobs.

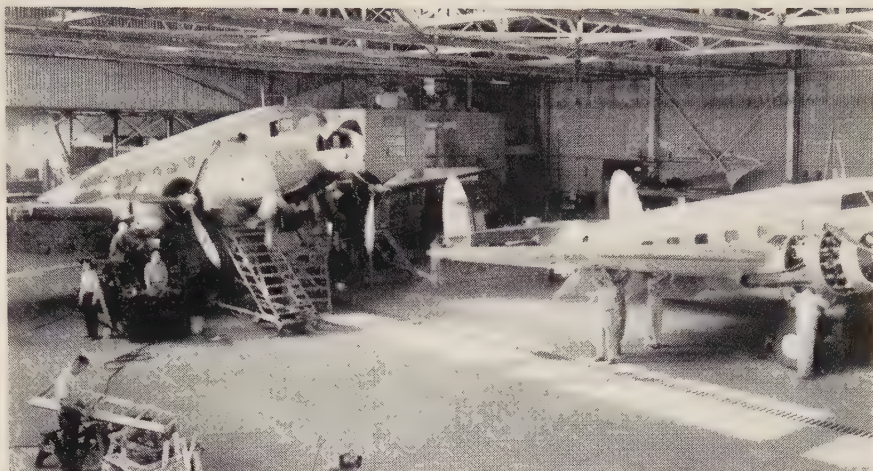
s a fixed-base operator, Aero Corp. of Atlanta, Ga., looks right through its customers and says what it thinks of the client.

For a southern firm this may not sound very polite, but it is. Aero has a specialized program of X-ray inspection of aircraft. The program permits a pilot to bring his plane to Aero in the afternoon, have Aero's technicians take up to 50 exposures of the critical parts of his ship and continue his flight the morning. Within 48 hours the pilot receives prints of the X-rays as well as a detailed analysis. Valuable time is not wasted during a layover with this type of insurance inspection being accomplished, states Tom Foster, president in charge of contracts.

Aero is a progressive firm, founded in 1945. It is the only commercial maintenance facility in the Atlanta area equipped to handle DC-3s and larger aircraft.

With four large hangars and supporting buildings, totalling 65,000 square feet, Aero has the modern, completely equipped facility for maintenance of all aircraft... from C-47s to Constellations. Visitors are amazed to see so many operations in one commercial repair station. Tom Lombardo, management head, says that in one hangar, military airplanes, helicopters and engines may progress through a production line overhaul. In another hangar a war-weary bomber or transport may be revitalized and refinished to the individual specifications of an executive skyliner.

Aero Of Atlanta

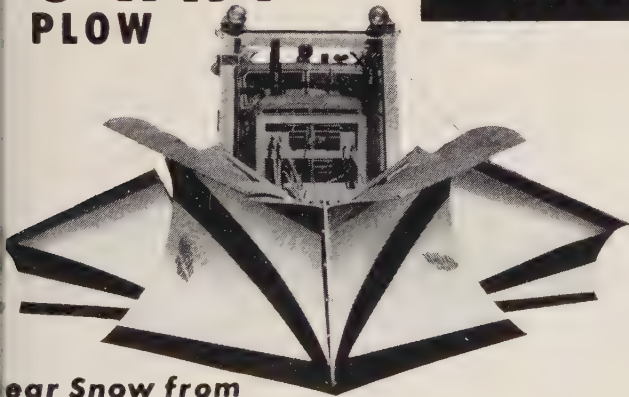


Aero's list of customers includes, besides large fleet operators and foreign governments, the U.S. Air Force, Army and Navy. The firm holds military contracts for the overhaul of multi-engine transports, single-engine liaison airplanes and helicopter engines. Their propeller overhaul shops are capable of handling rotor blades and helicopter transmissions.

In the management end there is Ray Beck, vice president in charge of production, in addition to Lombardo and

Foster. The latter feels that the "growth and trend of aviation demands that the maintenance base of tomorrow have dependability, versatility and unquestioned integrity. It must also give value for the customer's dollar to be able to keep its customers and attract business." And the people at Aero have incorporated this idea in their program. With more than 170 employees Aero Corp. of Atlanta is a large-scale operation that doesn't lose the personal touch.

3-WAY PLOW



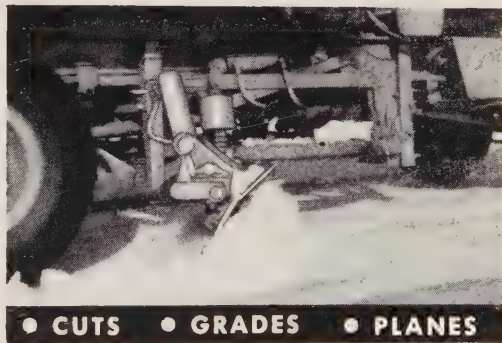
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Panic or Panacea

(Continued from page 20)

proach procedure. Also note in this proposed revision to Part 60.46 the section on unpublished instrument approach procedures being used only when authorized by the Administrator.

Such a prohibition is deemed necessary, says CAB, in order to minimize the hazards that can arise when an approach procedure is used by pilots other than those for whom it was intended. They add, "While the owner-operator of a private navigation facility may wish to allow other individuals to utilize a prescribed approach procedure, the Administrator's approval is required so that the necessary requirements of safety are observed."

The intent of this revision would be to place in violation any pilot who used the private facility for an instrument approach unless he not only had previous agreement with the aid owner but also approval by the Administrator.

This would raise the question, "When is an approach procedure not an approach procedure?"

Suppose the pilot let down 12 miles away from the privately owned aid knowing that he had a 1,000-foot ceiling underneath and then shuttled across to the airport VFR. Is that an approach procedure?

While the intent of the proposed revision is good, the wording lacks definite meaning and should be further revised to accomplish what is intended.

Enroute VFR Restrictions

Part 60.30—Clearance from clouds outside controlled airspace says: *When at an altitude of more than 700 feet above the surface, aircraft shall not be flown less than 500 feet vertically under, 1,000 feet vertically over, and 2,000 feet horizontally from any cloud formation. When at an altitude of 700 feet or less above the surface, aircraft shall be flown clear of clouds.*

Section (d) on flight visibility outside controlled airspace says: *No person shall operate an aircraft in flight when the flight visibility is less than one mile. However, helicopters may be flown at or below 700 feet above the surface when the flight visibility is less than one mile, if operated at such reduced speed as to give the pilot of such helicopter adequate opportunity to see other air traffic or any obstruction in time to avoid collision.*

This raises an interesting point. Suppose you have a 1,000-foot ceiling. Do you fly at 500 feet below the cloud deck, or do you fly legally at 700 feet and remain clear of clouds? One way gives you a 500 foot separation from the cloud base, the other gives you 300 feet separation. At any rate, you need one mile visibility at all times.

VFR Cruising Altitudes

One of the greatest foul-ups of all

traffic rules with us today is the currently effective Part 60.32 which requires the pilot to observe two different sets of rules to determine the appropriate cruising altitude.

These rules now differ depending on whether the flight is in controlled or uncontrolled airspace. Outside controlled airspace, above 3,000 feet and with less than three miles visibility, pilots are required to comply with the quadrantal rule. Aircraft in controlled airspace are required to be flown at or even thousand-foot altitudes as specified by the Administrator.

These rules specify a rather complex system of determining altitudes by direction of flight on colored airways and VOR airways, which is modified by a priority system where colored and VOR airways coincide or cross. For irregular portions of airspace designated as control areas there is no altitude specification. The CAB proposed to clear up this mess by a clean-sweep.

Part 60.32 would be amended to read: VFR cruising altitudes. When an aircraft is operated in level cruising flight at 3,000 feet or more above the surface the following cruising altitudes (Mean Sea Level) shall be observed:

Below 29,000 feet. At an altitude appropriate to the magnetic course being flown as follows: 0 to 179 degrees inclusive, at odd thousands plus 500 (3,500, 5,500 etc.); 180 to 359 degrees inclusive, at even thousands plus 500 (4,500, 6,500 etc.)

At or above 29,000 feet. At an altitude appropriate to the magnetic course being flown as follows: 0 to 89 degrees inclusive, at 4,000-foot intervals beginning at 29,000 (29,000, 33,000 etc.); 90 to 179 degrees inclusive at 4,000-foot intervals beginning at 30,000 (30,000, 34,000 etc.); 180 to 269 degrees inclusive at 4,000-foot intervals beginning at 31,000 (31,000, 35,000 etc.); 270 to 359 degrees inclusive at 4,000-foot intervals beginning at 32,000 (32,000, 36,000 etc.)

The "at or above 29,000 feet" changes are not, at the present, affecting business aircraft. With the advent of turbo-prop and full jet business aircraft there will be applicability.

The "below 29,000 feet" provision as far as VFR traffic only is concerned appears to be feasible.

Now we get into an IFR provision that deserves careful study.

IFR Cruising altitudes, Part 60.44. When an aircraft is operated in level cruising flight it shall be operated in accord with the following cruising altitudes: Within controlled airspace at altitudes authorized by air traffic control. In the absence of a specific altitude authorized by ATC, aircraft operated "on top" shall be flown at altitudes as specified in Part 60.32

R cruising altitudes).
That's fine. If you are "on top"
an IFR clearance, you observe
VFR rule for altitude and visibility.
You're "on the dials," you follow the
traffic control instructions. Now
as a wide open territory for all
of hangar flying.

part (b) of this section says that
ing Outside controlled airspace
be at an altitude appropriate
the magnetic course being flown
follows: 0 to 179 degrees inclu-
at odd thousands; 180 to 359
degrees inclusive at even thousands.
Remember, the preface to this par-
ar section said "When an aircraft
perated in level cruising flight."

Question: What happens when you
on instruments, heading 010 de-
s and you want to make a course
ge to 350 degrees? If you are fly-
at 5,000 feet, to take a magnetic
ing of 350, you will have to cruise
0,000 or 4,000 to meet the least
int of change of altitude.

Under present rules, and under the
osed revision, there is no provision
e for climb or descent IFR in un-
rolled airspace.

is can create a nasty turn of
s and neither CAA nor CAB has
answer to it under our present air-
traffic control system. The infor-
answer from these bodies is, "You
aking a calculated risk when you
in uncontrolled airspace on instru-
s."

may be pointed out, also, that
is no known serious incident re-
used because of this lack of regula-
The proposed changes in IFR and
flight rules, CAB points out, are
implify a system which has been
e so complex that many pilots,
ugh ignorance or mis-interpretation
ignore the present rules. Hopes
hat through simplification a great
ompliance will be observed. This

should result, says CAB, in greater
safety and better separation between
VFR and IFR traffic.

Control Area "Floors"

This item has been the subject of
tremendous interest on the part of all
aviation because it affects every type
of flying from military jets, airlines,
the thousands of private aircraft en-
gaged in business flying and those
thousands more who fly because of con-
venience or necessity, the general de-
scription of which is "the private pilot."

Currently the definition of control
area specifies that such area extends
"... upwards from an altitude of 700
feet above the surface . . ."

*The proposed regulation would
re-define this to read "... upwards
from an altitude of 700 feet or
higher, above the surface, to the
base of the continental control
area, within which air traffic con-
trol is exercised."*

The regulation would permit the Ad-
ministrator to make the designations
of the areas where the control area
floor would be raised above 700 feet.

Most significant advantage to be ob-
tained from this amendment would be,
says CAB, the additional airspace free
from the requirements and restrictions
of "controlled airspace." One big ad-
vantage is that the three-mile visibility
rule would be relaxed, and the one-mile
rule would apply.

Biggest and most controversial point
is, how high can this floor be raised?
Most advocated height is 3,000 feet
above the ground, and a great number
of pilots have urged that this be made
country-wide. While uniformity is high-
ly desirable and would, without doubt,
make the rule easy to comply with and
to observe, it does create a multiplicity
of problems. For example, minimum en-
route altitudes as well as transition and
approach altitudes, would have to be

raised. While this might be possible
in certain areas without difficulty, it
could not be applied to certain other
areas, such as mountainous regions,
without creating critical altitude prob-
lems.

Other areas, which could easily have
"floors" above 3,000 feet, under the
universal rule, would not be able to
take advantage of the situation. The
CAB, by giving the Administrator flex-
ible authority to set the "floor" at an
altitude best suited for the area, has
met the problem squarely and then
shifted the problem squarely to the
Administrator.

After all the arguments are evalu-
ated, and after the most objective think-
ing on this serious problem, all the air-
space user can do is to accept the pro-
posal and then fight like the furies to
see that the Administrator does comply
with the new rule and does take action.

There you have them. For better or
for worse, needed or not needed, pre-
cise or unprecise . . . they are here for
you to act upon. The CAB has given
you the opportunity to be heard.

Be sure that you are heard. And
when you do, either through your mem-
bership in a civil aviation group or in-
dividually, don't just say "I'm For" or
"I'm Against." Your reasons count.
The CAB isn't conducting a popularity
poll; they're trying to get all the facts
and considerations into the rule-making
process.

(Editor's note: Comments to the CAB
must be submitted in duplicate by Febru-
ary 28 to insure consideration, Oscar
Bakke, director, Bureau of Safety, states.)

✈✈

Tactair T-3 Pneumatic Autopilot

The Tactair T-3 pneumatically-oper-
ated autopilot has been selected as
optional factory-installed equipment in
the new 1958 Cessna Skylane, 182 and
180 models, according to announcement
made by R. B. Springer, sales manager,
Tactair, Inc., Bridgeport, Pa.

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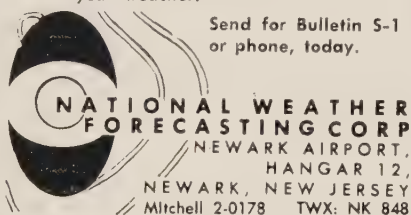
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Round Table

(Continued from page 12)

would take up the place of the private meteorologist?

Denardo (Denardo & McFarland): The role of the private meteorologist is a specialized weather service tailored to an individual's needs. By getting weather briefings from a private weather service a pilot gets the type of information he wants, when he wants it and, above all, as accurately as possible. Weather Bureau personnel have a big job to do, and they are not dealing with aviation all the time. A private meteorologist working for a company can provide the information when a specific trip arises. And it's important to know just what's going on, what's going to happen, the weather to be found on arrival, if the pilot can or cannot complete a trip. If the pilot called the Weather Bureau he'd receive a forecast and be briefed, and that would be the end of the sequence as far as he is concerned. A private meteorologist knows just what the pilot's capabilities are and the type of weather the pilot likes to fly. If it looks like the flight can be made, and the private meteorologist is on the weather picture all the time, and something changes, the meteorologist can inform the pilot. That's done generally on a 24-hour basis. Many corporations have heavy scheduling with flights going all over the country. They have to know if they can get there, or if they can't get there. Here comes the most important item of the private meteorologist, forecasts of more than 24-hours for planning purposes. The private meteorologist can give the pilot a forecast of 48 to 72 hours in advance of the forthcoming flight. If it looks questionable, he can tell the pilot so, and the executives can be forewarned and plan accordingly. This is the biggest thing, because you cannot get it from the Weather Bureau. Once past 24 hours it is hard to get anything on a planning basis for your aircraft. Biggest things are: specific and tailored information for first 24 hours of flight, and advance planning to know if the flight may or may not be made. We have come into contact with this more than anything else. It isn't up to the pilot to check all the time, it's up to the private meteorologist to inform the pilot.

Merewether: I'm curious to know how you handle flights operating away from the home base . . . providing service to a man in Pittsburgh, or St. Louis and going west. Does he call you long-distance?

Denardo: We have a flight log on each aircraft we handle. For example, Alcoa or Westinghouse have three aircraft. We have a flight schedule on each of these aircraft. If 02A is going out at 10 o'clock we know where he's going and if he's coming back that day. Consequently, if we have a plane leaving Pittsburgh and going on to St. Louis or

even further, he will have been briefed on weather for a one-day return trip or if he's overnight he will have the weather for two days en route. Most likely he will phone the following morning. They call collect, so we know right away where they are, if we don't have it on the log. No matter where the pilot is going or how long he will be away, we will have his weather information ready.

Captain Van Liew (National Weather Forecasting): I agree with Joe Denardo completely in this follow-up and service, meaning that a private weather forecasting company can give a pilot making him feel very definitely that he is not playing out in left field. And again I'd like to say that the Weather Bureau does a terrific job. One thing that I do like to stress, being a pilot myself and flying around 85 hours a month, in this day and age of aids, navigation and radar and a lot of other things, it's rather a stupid thing to go down and say that the weather is going to stop many of the professional pilots. When I fly United 701 to San Francisco I know very well that I'm going to take off and I'm going to fly to San Francisco. Its all relative as far as gas and weather is concerned whether I'm flying a DC7 that has 10½ hours of fuel or whether we're flying a DC3 that has an amount. My alternate might be Sacramento, or Oakland, or I might have to go into Salt Lake for gasoline. But I know that I'm going to takeoff and then I'm going to fly to SFO. Now, the thing I'm interested in as a pilot is not whether I'm going to get there—although I try to make the best possible time—but whether I'm going to get into en route. Another point, if I make up 50 hours of flying a year at eight cents per minute, I have saved United Air Lines a considerable amount of money. That can only be done through intelligent flight planning. I don't think there is a pilot sitting here who can't go into 200½ or less with the automatic couplers and the aids to navigation that we have today. I think one of the great things that a private meteorologist can do for corporate flying, in this day when the company is watching the dollar sign, is to help with the flight plan.

Lacey (National Weather Forecasting): I want to emphasize planning. I don't like to tell any pilot that I think he should or should not go. That is not the type of information that I should be giving. I should tell him that if he goes one way he will encounter such and such conditions, and when he gets there the ceilings will be so and so. If he's really concerned about the ceilings, I will absorb this information. On the other hand, I would say that if he goes by another route, he could avoid some thunder storms or some other rough condition. It is up to the pilot, however, to make his own decisions based on the information. This is a big part of the role as private meteorologists . . . to advise as much as possible where more comfortable flying can be done. We have come to the point that we

is. I don't say that we can describe to the last iota what conditions everywhere. We can say where the desirable flying is, and we feel that pilot should know this in spite of radar set, big plane or small plane. I think he likes to be comfortable and his passengers comfortable. We help him to accomplish this by telling him which way to go or what altitude to go. Specific details can't be given, but we can tell that tomorrow or the next day will be better or worse than today. Planning is very important for business people. I know the pilot who goes to the airport where his car is when he's headed home. If we can help him to plan ahead both in days and in a specific flight, we've accomplished something for the pilot, both in safety and economy. We might save him plane hours by directing the plane one way or another, or we might save him money. We have to give a little economy for safety.

Ray (Murray & Trettel): Since the beginning of 1956 when we first began giving special flight forecasts to pilots, one or two factors stand out in the service. First is the question of accessibility. A pilot preparing a flight plan normally will call somewhere for a weather forecast. In the Chicago area there are some 4,000 licensed pilots. The U.S. Weather Bureau provides a forecast service for any or all of these pilots. Any one is free to call the Weather Bureau office at any time. I wonder the Weather Bureau forecasters can be swamped. How much time does the forecaster have to spend preparing a good flight forecast? Many times, in the case of the Weather Bureau, almost none. Not so in the case of the private consultant. Our accounts normally call us 24 hours in advance and give us their proposed flight plan. Our forecasters can arrange their schedule so as to spend as much time as necessary working out the forecast. In the process of analyzing flight weather conditions, a second advantage in using a private consultant is developed. He fully evaluates his confidence in the forecast; in other words, what weather "probabilities" are involved in the existing weather picture. Every meteorologist and, I think, every pilot realizes that you can make one forecast of which you can be very confident, and you can make another which is very questionable. It is important that a pilot evaluate the risk or the probability under which he is operating.

There are other less obvious advantages to such a service. An account who goes to our office talks to a meteorologist who is not only directly interested in seeing that he completes his flight successfully, but also knows the type and characteristics of aircraft that the company is operating. In most cases the private consultant has a detailed picture of the experience of the pilot; a factor which can be important whenever you fly into marginal weather conditions. We have a policy similar to others expressed here, that is, it is not up to

the meteorologist to tell the pilot whether or not to go. However, it often follows that the extra time and effort the consultant is able to give to a marginal weather forecast makes a lot of difference in its dependability. As far as 24 to 48 hour forecasting is concerned, if there is reasonable doubt that the flight can get off the ground, many times the executive will plan to use another means of transportation. This advance briefing, or consulting, forms a significant part of our service. One final thought, we realize that this flight forecast service competes more closely with that provided by the Weather Bureau than any of our other industrial forecasting services. In the year-and-a-half we have provided this aviation service, we have found that both from a dollars and cents standpoint and from the safety standpoint, it has proved most effective. In a word, the pilots like it.

Wallace (Northeast Weather Service): The purpose of the private service is, to drive it home again, safety, comfort and efficiency. We don't consider ourselves in competition with the Weather Bureau. If weather were an exact science, we would have very little to offer other than that which the Weather Bureau now offers with the exception of service. The private weather concern can be considered a member of the team of the client who subscribes to his services. It is the responsibility of the private consultant to see that his client is notified immediately of any changes in his forecast. Many times this change might be the difference between whether or not a scheduled flight can be completed successfully. Anytime that the passenger can be spared a few hours of waiting at the airport, or the inconvenience of a motor or train trip from an alternate airport to his destination, then one of the reasons for private weather service is accomplished. This is a factor that the flight operations manager should want to consider . . . not only from the viewpoint of making his service more attractive, but also from the point of money that can be saved by eliminating some of these standby periods.

Continuity in a forecast is offered by the private meteorologist. Weather Bureau briefings for flights out of one Bureau district into another are usually composed of forecasts from the district offices the flight will pass over en route. Many times there exists a variety of opinions of future weather developments at these district offices. This can be confusing to the pilot whereas, if the entire route and terminal forecasts are prepared at one office, there exists a continuity in the forecasted weather. Another point is that most Weather Bureau stations are at large metropolitan airports served by airlines. Most of the business flying is from smaller fields that do not have Weather Bureau stations. Here the role of the private weather service is more of a conven-

(Continued on page 56)



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(Continued from page 16)

manuals and communications, he must then pay some attention to maintaining his own proficiency and that of his crews, not knowing of course, into what airport or area they may have to fly next. There are, of course, many other odds and ends to cover such as provisioning for food and beverages.

Having considered all this, the chief pilot then faces up to a reasonable control of the costs, i.e., personnel, fuel and oil, insurance, maintenance, hangar, provisioning, landing fees, etc. Certainly an operating statement and budget projections will help the pilot convince the management that he has some kind of control over his department.

Having attempted to digest this, our man must return his thoughts to his flying equipment. Does it need modification? Is it a good time to trade? What new equipment is coming along and is it suitable for his "airline"? Or, just what does his company need in its business fleet.

There is much, in fact, too much, for a pilot or even several pilots to attempt. These are management problems and functions that deserve specialized attention.

To meet this need, over the years there have evolved highly competent groups of experts. Such firms are Albert E. Blomquist and Associates, transportation engineers, Ringoes, N.J.; Flight Safety, Inc., of New York, Chicago and Dallas; R. Dixon Speas, Selig Altschul, both of New York; Executive Air Transport Co., Smithtown, L.I., New York; Max Conrad of Florida; and Philip G. Mack Jr., Fort Wayne, Ind. Blomquist, engaged in all phases of aviation since 1930, has enlarged its organization to provide experience and trained consulting advice and service for each phase of business flying. This has resulted after many years of service to such clients as National, Icelandic and Israel Airlines, Fairchild Engine and Aircraft Corp., Lockheed Air Service, The United States Corps of Engineers and a number of others. These organizations have expert civil and military experienced check pilots qualified in all phases of single and multi-engine, piston and turbine powered aircraft operation.

They provide, in addition, management assistance, maintenance direction, procedures and operations systems, manual development, aircraft analysis and modification, aircraft and aviation equipment studies, communications assistance, program planning, cost controls, physical plant planning and provisioning programs.

Certainly the importance of business flying warrants the full support of management and the assistance of available tools to assure safe, dependable air movement of that very scarce commodity, the business executive.

Does an evaluation of your company's aviation department permit complacency?



By Russ Brinkley, Pres.

Interest in the OX5 Club has extended far beyond the boundaries of the United States and, at the present time, new wings are operating or are in the process of formation in many far off places. These new chapters are made up of Americans and Canadians who are now engaged in flying, or in other business fields, remote from the native lands.

Brian Daville, a veteran of overseas flying during World War I, holds forth as the President of the Canada Wing at Montreal. Daville was engaged in barnstorming and flying for motion pictures until he settled down to the importing and distribution of choice liquors. The Canada Wing is planning a Dominion-wide meeting at Toronto next spring.

In Alaska, three energetic sparkplugs are building up a large wing comprised chiefly of bush pilots and airline personnel. Winter months have afforded Noel Wien, Gene Strouse and L. Leavitt a long awaited opportunity to round up the many pioneer airmen who have been making aviation history around the Arctic Circle.

The Hawaiian Islands now serve as the home of numerous airmen who work their wings behind the OX5 and who are engaged in various forms of earning a livelihood. These pilots are being rounded up by William Holloway in Honolulu. Bill recently visited the States, during his annual business tour and had an opportunity to visit with many OX5ers.

The various countries of South and Central America are well represented in the new OX5 roster, thanks to the efforts of Ken Benson, Miami aircraft salesman; Glen Sampson, of Caracas, Venezuela, who recently ditched his third multi-engine craft in the ocean; and C. J. Tippet who is associated with the ICAO office in Lima, Peru.

As for the most distant member, George Bruce Bolt recently sent in his application from Auckland, New Zealand. Still other members write us regularly from remote areas of the world where they are serving on temporary assignments and frequently meet with other oldtime flyers who can speak the OX5 lingo.

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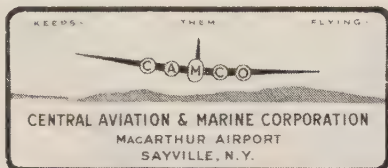
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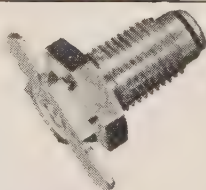
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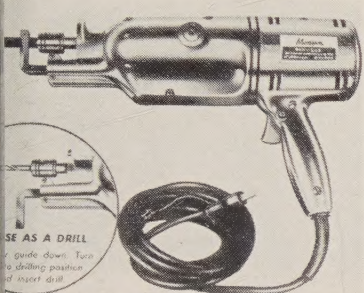
NU-AVI-QUIP

Combination Hack Saw-Drill

Device for quick cutting or drilling of steel, sheet metal, pipe, rod, tubing, plastic, wood, wall board, etc., been developed by Modern Manufacturing Co., Inc., in the form of a shaped combination hack saw and

known as the "Trades Master," the lightweight tool has a trigger switch and is self-current.

The unit operates on 110-120 V, AC, and has a ground wire through the handle to assure safety in operation. The adapter chuck is furnished to accommodate any size drill up to and including 1/4-in. Other attachments include a flat or rotary file and a nibbler for cutting through metal up to 20

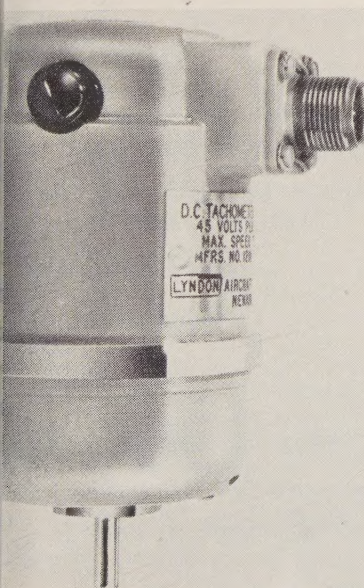


Tachometer Generator

D.C. Tachometer Generator has been added to Lyndon Aircraft's line of accessory equipment for aviation, engine and missile industries.

The new generator, Model 1201, generates D.C. Voltage in proportion to rotation. Operating to a maximum speed of 7,500 rpm with a ripple of less than 4 percent, the generator puts out 45 volts D.C. per 1,000 rotations.

The generator shown measures 4 in. x 2 in. diameter.



New Chemical In Tablet Form

Stratotab, a tablet for use in airplane chemical toilets, is a new product by Fine Organics, Inc., manufacturers of aircraft maintenance products.

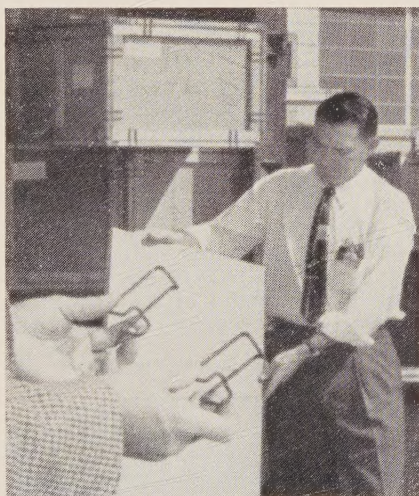
The Stratotab is used in a water solution before flight. It can be added during flight to remove objectionable odors; can be used in solution for post-flight cleaning; and can be used as a disinfectant. Neither skin nor painted surfaces can be harmed by the solutions, says the manufacturer.

Klimp Modular Panel Packaging

A five-cent spring clamp can save millions of dollars in cost of plywood and paper overlaid veneer shipping materials, North American Aviation engineers estimate regarding the use of their spring fastener packaging system.

The Klimp is a spring clamp used in assembling panels into boxes. They can be re-used and do not damage the container. A box can be assembled in 33 percent less time with Klimp fasteners than with nails, says NAA.

By assembling modular panels into shipping containers with Klimp fasteners, cost savings through panel re-use are combined with modular packaging versatility.



New Process Toughens Instrument Dial Surfaces

A new process for marking and finishing lacquered instrument dials which can extend functional life under extreme environmental and operating conditions by as much as 100 percent, is a product of United States Radium Corp.

The technique essentially involves the high temperature fusing of a sprayed prime coat, sprayed background coat, image and sprayed top-coat. Resulting surface is said to be well within tolerances set out in MIL-M-13231 covering corrosion, abrasion, moisture resistance, thermal shock and resistance to solvents.

Plastic-Type Protective Coating

A super-tough, plastic-type protective coating, a blend of silicones and epoxies, is announced by Mono-Seal Products.

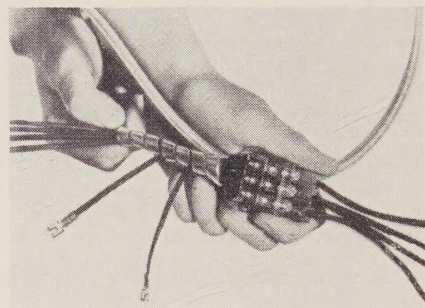
The coating material has demonstrated properties for corrosion resistance, impact resistance, long life and weather and moisture resistance. It has a natural "stretch," and will not chip or peel when bent or dented, says the firm.

Spiral Plastic Cable Wrapping

AMP-Spirap is a spirally-cut plastic wrapping that eliminates cable lacing, insulation damage and pulling of wires through spaghetti tubing, says manufacturer, AMP Inc.

The Spirap can be applied quickly to wire bundles up to 3 1/2-in. diameter. It permits individual wires to be entered or led out at any point.

Sample may be obtained from the manufacturer.

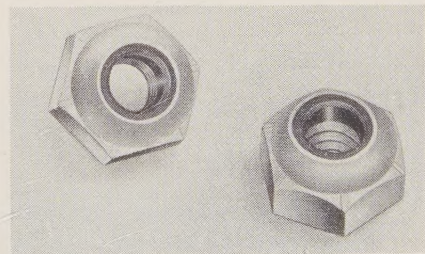


New Nylon-Insert Locknut

A new line of nylon insert locknuts features a die-cast zinc alloy hex nut body and molded nylon compression collar for locking element. A special manufacturing approach firmly anchors the unthreaded nylon collar in the nut body, preventing the collar from turning or breaking out. Nylon locking element has constant grip on screw threads, dampens vibration, seals out moisture and resists loosening.

The nylon collar tends to return to its original shape when removed from the screw permitting re-use. Locking effect exists at any point on mating screw even if not tightened down against a seating surface.

Complete range of thread sizes from No. 4 to 1/2-in. is planned. Samples are available by request from the Gries Reproducer Corp.



Round Table

(Continued from page 49)

ience; perhaps it is a supplement to the Weather Bureau.

Spengler: How about some comments or rebuttals?

Van Liew: One thing not stressed is that there is no better meteorologist than the pilot who has been flying for years, according to that pilot. At least the meteorologist is on top of the weather eight hours a shift. And it's pretty difficult for a pilot to make up that number of hours in a few minutes of study prior to a flight.

Merewether: The private meteorologist service is growing up. What's the possibility of an arrangement such as the flowers-by-wire service for the private weather service which has one base of operations? . . . that is, a cooperative arrangement between the private weather services for their clients on long trips.

Murray: We have polled our aviation clients on this question. One objection to such an arrangement lies in the fact that the "Home" weather office meteorologist knows the client's policy, likes and dislikes regarding weather. The idea of a national chain of consulting services makes a fine promotional idea. But in practice, it's not often that one of our accounts will land at a field where another weather service is located. So, a phone call is going to have to be made somewhere for weather information. When one of our planes is on a trip we have its itinerary so that when the pilot phones for a forecast covering the next leg of his trip, our forecasters already have the information he wants. I am not discarding the idea of linking consultants together. I am only citing certain objections to such an arrangement.

Wallace: Although most of our clients supply us with a flight schedule so that we know approximately when the return flight is planned, there are times when this schedule is changed which can mean that the return forecast has not been prepared when they call or a new forecast must be prepared for late departures. If there were some arrangement between reputable private weather services for an exchange of service to each other's clients, I believe all concerned would benefit. In fact, we have one prospective client who tells us that he will subscribe to our service the minute we arrange some such service exchange in the Chicago area.

Murray: The idea is interesting. Still

another objection raised by an account of ours is that while we have been forecasting for the Chicago area for 11 years, some other firm might have much less "local" forecasting experience than we. Thus, when he plans to come into the Chicago area, he would rather have our local area forecast. This may not be a completely valid objection because firms that would make up such a network would be well established and capably staffed to provide the best possible route and destination information.

Lacey: Adding to that, some pilots, under such an arrangement, would come back from the West Coast, for instance, and say they had been given a bum steer. This won't do any of us any good. **Denardo:** It's my experience that the client and the private consultant develop a relationship that cannot find substitution. The client, relying on his forecaster, would rather phone from across the continent than seek local aid. This, plus the fact that business messages can be handled by the consultant on such a phone call. And it is a service being sold. Such things are part of it. Further, we've had a couple of Jack Murray's pilots come into Allegheny Airport. We've briefed them without giving it financial thought. I think if the meteorologists got together on something like this, just out of friendship, the pilot would get his briefing, and we, at least, are not going to charge him for it. However, 80 percent of our clients will call us when they're starting a return trip, if the weather is at all questionable. Therefore, regarding the chain idea, it may be a good promotional thing, but in reality, I don't feel it would work out.

END—PART I

(Next month's issue will carry answers and discussions on whether or not the private weather service relieves the pilot of responsibility; does the business pilot fly without seeing a weather map?; legal liability of the private meteorologist; pilot reports, costs of private service.)



CONTRACT SIGNED naming *Spartan Aircraft Aviation Div.* distributor and service center for *Collins Radio Co.* Signing document were *Byron E. Gardner*, sales manager, *Spartan Aviation Div.*, left; *Capt. Maxwell W. Balfour*, vice pres., *Spartan Aircraft Co.*, seated; *Dan L. Cahill*, regional sales engineer, *Collins Radio Co.* (See *Aviation Roundup*.)

Vertigo As A Cause of Pilot Error In Aircraft

By: Brant Clark, Ph.D. and Captain Ashton Graybiel, MC, USN

VERTIGO is a phenomenon well known to pilots. Most pilots are familiar with it from personal experience and the remainder have heard it discussed on frequent occasions. For pilots, vertigo includes a wide variety of experiences, but generally speaking involves confusion regarding their position in space.

The pilot's method of dealing with vertigo so that it does not affect his efficiency in flying the aircraft varies from pilot to pilot, and appears to be influenced somewhat by the conditions of flight and the severity of the disorientation. The procedure mentioned the greatest number of times is *checking the instruments*. This was specifically mentioned by 76 percent of the pilots queried.

It should be pointed out, however, that achieving or maintaining coordinated flight by means of the flight instruments is by no means an immediate, sure cure for the illusory sensations of vertigo. The vertigo may continue for a considerable period of time after co-ordinated flight is achieved, or, indeed, may occur during straight and level flight. An important skill to be learned by the novice is to disregard the vertigo and rely on the instruments and this may be a very demanding task even for the skilled pilot. Some pilots (15 per cent) reported that the vertigo continued until they broke clear so that they could see the ground or a horizon. This is certainly a major factor in eliminating vertigo but again it is not always possible to break clear of overcast, and some vertigo is found under conditions of good visibility.

The seven causes of vertigo most commonly listed by the pilots were *poor visibility, turning, flying without mixing contact and instruments, inattention to instruments, rough air and fatigue*. This list of causes, together with the varied procedures used by the pilot to cope with vertigo, support the notion of multiple causation and the unlikelihood of finding a simple method to eliminate vertigo.

Business Plane Flies North Atlantic On 16,000 Mile Trip

Considered a routine flight, an Aeromarine Commander crossed the north Atlantic enroute to Japan on a 16,000 mile trip. Stops along the way included Keflavik, Iceland; Prestwick, Scotland; London, Rome, Athens, Nicosia, Bahrain, Karachi, Delhi, Calcutta, Bangkok; Tourane, Indo China; Hong Kong, Okinawa, Kagoshima and Tokyo.

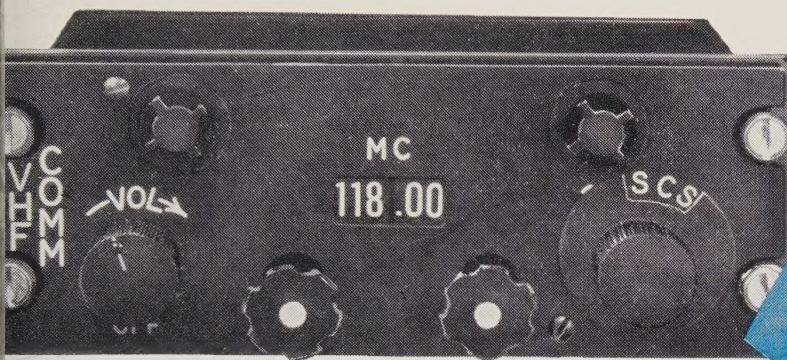
More than 26 of the 80 flying hours were on instruments, the ferry pilot reported. The engine burned 22.7 gallons per hour. With gasoline aboard for more than eight hours of flight, phases of the trip were made with range to spare.

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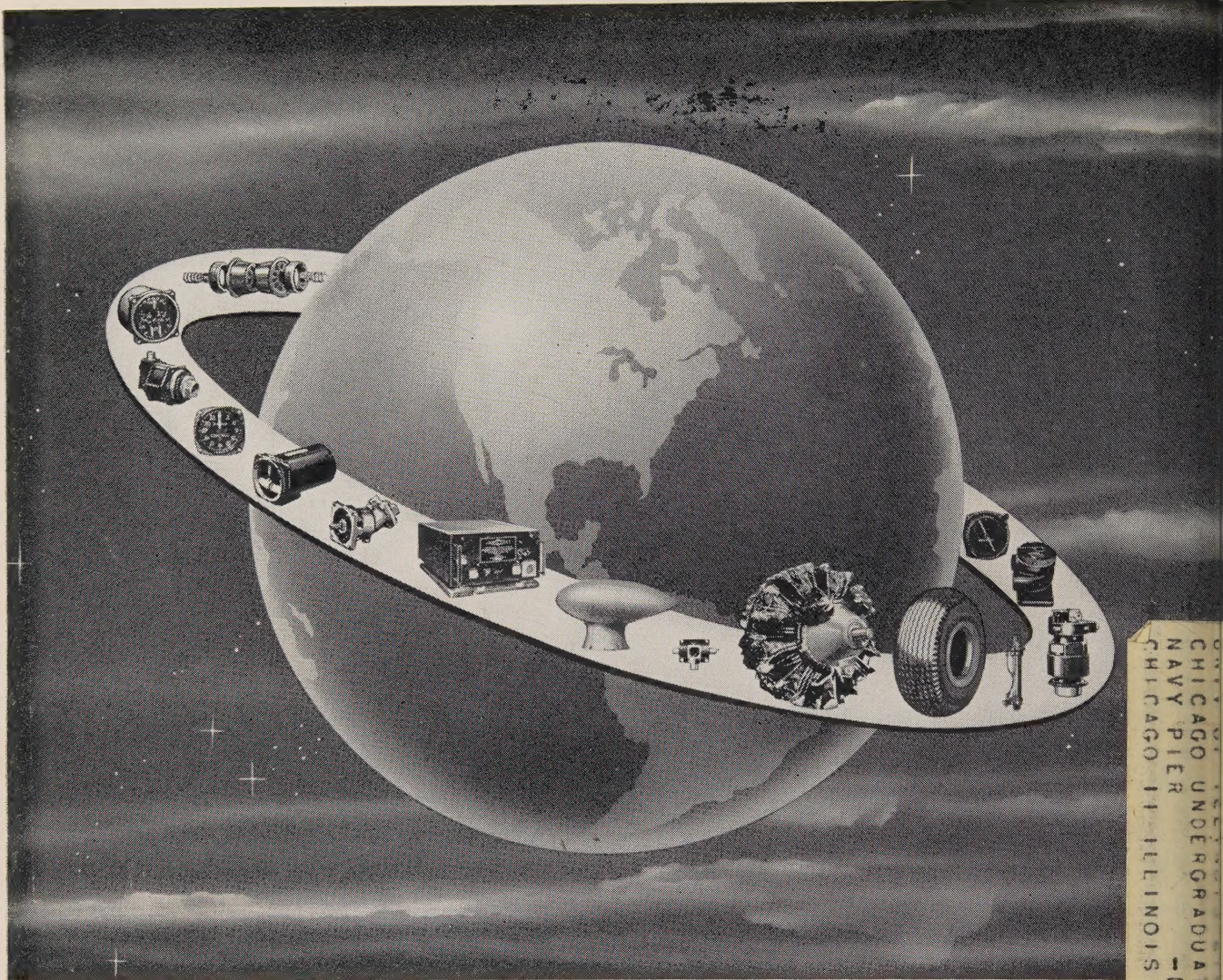
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